Irish Supplement to The Chemist and Druggist

Fifth Year. SATURDAY, AUGUST 3, 1901. No. 56.

Review of the Month.

AFTER an interval of over twenty years the British Pharmaceutical Conference have this week again met in Dublin. Mr. G. Claridge Druce, Hon. M.A., Oxon., F.L.S., and pharmaceutical chemist, is the President of the Conference. A reception was held in the Science and Art Museum in Kildare Street on July 29, and on Tuesday morning the sessions of the Conference began. The President's address, which occupied the greater part of the morning to deliver, is printed in full in the *C. & D.* for this week, where will also be found a report of the papers read and the discussion which they provoked.

MR. G. CLARIDGE DRUCE.

* * * *

As of special interest to chemists in Ireland we call attention of non-subscribers to illustrated accounts of the sights of Dublin, and also the apothecary's art as practised there. These articles appeared in the *C. & D.* of July 20 and 27, and, being written from a chemist's point of view, present details of several phases of pharmacy in Dublin which pharmacists will appreciate. The drug-businesses described in the latter article are the Apothecaries' Hall, Mr. W. N. Allen, Mr. G. D. Beggs, Messrs. Boileau & Boyd (Limited), Butler's Medical Hall, Messrs. Evans, Messrs. J. J. Graham & Co., Messrs. Hamilton, Long & Co. (Limited), Messrs. Hayes, Conyngham & Robinson (Limited), Mr. Patrick Kelly, Dr. Leonard's Medical Hall, Mr. James Michie, Price's Medical Hall, Mr. John Smith, and Mr. W. F. Wells.

* * * *

THE Council-meeting of the Pharmaceutical Society of Ireland could not be held in July owing to the lack of a quorum, but evidence of the Council's activity is forthcoming from the Pharmacy Act cases which have been heard during the month. Two cases came off at Sligo on July 15. The first case against the Sligo Drug Company was dismissed, owing to a flaw in the summons—the defendant had been charged with "compounding a certain medical prescription," the offences according to the Act being "selling" or "keeping a shop open for compounding." In the second summons against the company for selling poison in the form of a blister, a fine of 5*l.* was inflicted, but no costs were allowed, and the Mayor expressed his willingness to give a recommendation to the Lord Lieutenant for a reduction of the penalty.

* * * *

THE Tullamore case ended at the Tullamore Petty Sessions in July. It will be remembered that an assistant with Messrs. P. & H. Egan, Tullamore, was prosecuted for poison-selling, and the summons was dismissed. On a case being stated the superior Court held that the Magistrates ought to have convicted, and when the case was sent back to the Petty Sessions Court the assistant was fined. Messrs. Egan were then prosecuted, but the Magistrates held that a company could not be proceeded against; then the Court of Appeal decided otherwise, and at the last sessions the Magistrates inflicted a fine of 1*s.*, and the costs of the court.

* * * *

THE Prime Minister has amended the draft report of the House of Lords Committee on the early closing of shops by adding a recommendation that town councils should be authorised to pass Provisional Orders, making such regulations in respect to the closing of shops as may seem to them to be necessary for the areas under their jurisdiction. The Provisional Orders are to be submitted to Parliament in the usual way before acquiring the force of law.

* * * *

THE annual meetings of the Proprietary Articles Trades' Association and the Chemists' Defence Association were held at Chingford on July 18. The idea of holding the meetings amidst the rural surroundings of Epping Forest was to combine business with pleasure. The meetings passed off very successfully, the Chairman of both Associations (Mr. Albert Cooper) reviewing in his addresses the work done during the year. Everyone seemed satisfied with the day's proceedings and with the progress of the Associations.

* * * *

THE annual meeting of the Society of Chemical Industry at Glasgow is especially interesting to pharmacists, because the President (Mr. J. W. Swan) is a chemist and druggist. Mr. Swan was in business at Newcastle-on-Tyne, but his name is known throughout the world on account of the "Swan" electric light and his discovery of the method of ripening photographic emulsion which has made rapid photography possible. The address which Mr. Swan delivered before the Society dealt chiefly with electro-metallurgy, and is given in abstract in last week's *C. & D.*

* * * *

THE British Congress of Tuberculosis was held in London last week. Extraordinary interest was taken in the proceedings in medical circles, and the King sent a message expressing his approval of the Congress. The feature by which the meeting will be remembered hereafter is the dramatic utterance of Professor Koch, of Berlin, the discoverer of the active bacillus of tuberculosis, who asserted that tuberculosis was not transmitted from animals to human beings. The great source of tuberculosis in human beings is, according to Professor Koch, direct infection from the sputum of infected persons.

* * * *

SOME of the items of the Summer number of THE CHEMIST AND DRUGGIST have been mentioned in the preceding paragraphs. That number again reached the high-water mark, and its contents, both literary and advertisements, will interest everybody connected with the drug-trade. In addition to the article on Dublin pharmacy, there were descriptions of pharmacy as carried on in Kent, Spain, Switzerland, and Germany. These accounts were illustrated, there being no fewer than 114 pictures in the Summer number, which may be taken as an earnest of the fact that the contents were pleasant reading.

Pharmaceutical Society of Ireland.

THE monthly meeting of the Council was convened for Wednesday, July 3, at the Society's House, Lower Mount Street, Dublin, at 3 o'clock. At 4 o'clock there was not a quorum. The members who did attend were the President (Mr. Beggs), the Vice-President (Mr. J. I. Bernard), and Messrs. W. F. Wells, Kelly, and Brown. Before the members who attended separated the President said it was a shame that, when they had a Council of twenty-one members, they could not get a quorum for the transaction of business.

PASS-LISTS.

The successful candidates for the July Pharmaceutical Licence examination were:—D. Flynn, T. W. Campion, F. D. Smyth, (W. H. Macauley, P. Moloney, A. Wilson, equal), J. S. Strange, (J. Carroll, J. Pattson, equal), A. A. Pellissier, W. J. McKinney, S. G. Mackey, C. R. McMullen. Eight candidates were rejected.

In the Registered Druggist examination, T. G. Blair and P. V. Coyle passed. Three candidates were rejected.

Pharmaceutical Assistant Examination.—A. T. Bennett, G. B. Campbell, and A. J. Smyth passed. Two candidates were rejected.

Preliminary Examination.—D. McMullan, R. Chambers, J. Kilpatrick, T. E. Dixon, A. E. Anderson, S. Fleming, A. F. Maxwell, A. H. Leahy, G. Todd, J. B. Mairs, D. C. Glenn, S. S. Badger, A. S. McDowell, J. E. Cantwell, and D. Slattery passed. Fourteen candidates were rejected.

QUESTIONS SET AT THE EXAMINATION FOR LICENCE.

MATERIA MEDICA.

1. How is jalap resin prepared? Give tests for adulterations.
2. Give source, N. O., descriptive characters, and preparations of Panama-bark. It contains an amorphous glucoside: mention any other plants containing the same or a closely allied substance.
3. What is hard paraffin? State melting-point: also tests and melting-point of soft paraffin.
4. Goa-powder. Give source, N. O., characters, and preparations.
5. What are the most important constituents of nux vomica? State process for assaying their strength, and amount of alkaloids in each preparation. Give source, and N. O., of plant yielding the seed.

BOTANY.

6. Describe the essential functions of leaves. Explain any special terms you may use.
7. What is the fruit? Distinguish between apocarpous and syncarpous fruits, and give examples of each.
8. Contrast the N. O.'s *Ranunculaceæ* and *Rosaceæ*. Enumerate B.P. representatives and their preparations.

GENERAL AND PHARMACEUTICAL CHEMISTRY.

(Time—Two and a half hours.)

[Six Questions only need be attempted.]

1. Describe and explain any one method for determining the molecular weight of a substance which can be vaporised without decomposition.
2. Describe how solution of magnesium carbonate is prepared, explaining fully the reason for each step of the process. If 20 c.c. of the solution yield a calcined residue of 0·16 gramme, how many grammes of magnesium carbonate per litre does the solution contain?
3. How is the caustic soda of commerce prepared? What impurities does it usually contain, and how would you proceed to purify it?
4. What substances are formed when nitric acid of different degrees of concentration acts upon zinc? Give equations for the reactions.
5. How would you test a sample of ether for water, methylic ether, aldehyde, and hydrogen peroxide?
6. What is meant by "condensation" in organic chemistry? Name a commonly used condensing-agent, and give an example of its action.
7. Give two general reactions for preparing fatty acids.
8. Write the constitutional formulæ of all the compounds you know whose formula is $C_4H_{10}O$, and name them.

PRACTICAL CHEMISTRY.

(Time—Three hours.)

1. Mixture of two salts.
2. Determination of strength of syrup of ferrous iodide, or of hydrogen peroxide.

PHARMACY.

1. What is a disc? Name those that are official, and give strength of each.
2. State how the following are prepared:—

   Liquor. hamamelidis.
   Ferri carbonas saccharatus.
   Lotio hydrargyri nigra.
   Adeps lanæ hydrosus.
   Charta sinapis.

3. Under extract of nux vomica, the Pharmacopœia directs a fluid ounce of liquid extract to be evaporaeed till moderately firm, the difference in weight between this extract and one hundred and thirty-one and quarter gr. (131¼) indicates the amount of milk-sugar required. Explain why these figures (131¼) are used.
4. State the composition of—

   Linimentum sinapis.
   Tinctura benzoini composita.
   Pilula aloes et ferri.
   Unguentum resinæ.
   Pulvis jalapæ compositus.

5. Under what conditions are the following sold to the public?—

   Sulphuric ether.
   Tartar emetic.
   Fowler's solution of arsenic.
   Paregoric elixir.

EXAMINATION FOR PHARMACEUTICAL ASSISTANT.

PHARMACY.

1. Give the formulæ for each of the following:—

   Compound mixture of iron.
   Chalk-mixture.
   Compound powder of almonds.
   Compound powder of opium.
   Compound powder of scammony.
   Compound powder of rhubarb.

2. Give the dose of each of the following:—

   Sodium arsenate.
   Sodium carbonate.
   Sodium sulphite.
   Camphor.
   Pepsine.
   Sodium bicarbonate.
   Sodium iodide.
   Grey powder.
   Tincture of iodine.
   Boracic acid.

3. Enumerate the wines made on orange and on sherry wine. Give the strength and dose of each, also the percentage of alcohol of both.

(*Continued on page* 60)

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4. State the solubility of each of the following, respectively, in alcohol and in water:—Camphor, menthol, phenazonum, phenacetine, paraldehyde.

5. Write out the following directions in Latin, using no abbreviations:—

Half a wineglassful every two or three hours.

One-eighth part, with as much cold water, after each meal.

One teaspoonful each morning, fasting, in a tumbler of cold water.

Bathe the eyes three or four times during the day.

REGISTERED DRUGGIST EXAMINATION.

1. A creditor received 16*s.* 3*d.* in the £, and thereby lost 135*l.* 10*s.*: how much was due to him?

2. Find the value of—

$$3\tfrac{1}{5} \times 6\tfrac{1}{4} + 5\tfrac{1}{3} \times 1\tfrac{1}{2}.$$
$$\cdot 375 \text{ of } 1l.$$

3. If with a capital of 1,000*l.* a tradesman gains 100*l.* in seven months, what capital must he have in order to gain 60*l.* 10*s.* in eleven months?

4. Olive oil is bought at 6*s.* 8*d.* per gal., and sold at the rate of 5 oz. for 4*d.*: what profit is made by selling 36 gals.? What is the gain per cent.?

5. You are given three bottles, containing liq. ammoniæ, spt. ammon. aromat., and lin. camph. ammon., respectively; how would you recognise each?

6. What are the regulations regarding the sale of the following?—Paregoric, cyanide of potassium, phenol, white precipitate.

7. Write a short essay on "Punctuality"; *or* "Intemperance."

PRELIMINARY.

ENGLISH.

1. Give—

(*a*) The feminine of colt, sloven, wizard, hart, testator, marquess, and peacock.

(*b*) Plurals of basis, son-in-law, cherub, index, and staff.

2. Correct, if necessary, and give your reasons:—

(*a*) It was either me or my friend.
(*b*) Will I give you some apple tart?
(*c*) Everyone raised their hats.
(*d*) Either the one or the other of them are mistaken.
(*e*) Who, did you say, he spoke of?

3. What is an "idiom"? Give two examples, and explain them.

4. Compare witty, good, bad, happy, and far. Decline him, we, and fox.

5. Distinguish between an affix and a prefix. Give examples.

6. (*a*) Give the principal parts of be, abide, forget, sing, hurt, work, hit, go.

(*b*) What are impersonal verbs? Give four examples.

7. Parse words in italics:—

Here lies our good *Edmund whose* genius was *such*,
We *scarcely can praise it*, or blame it *too* much.

8. Write a composition on *one* of the following subjects:—

(*a*) The joys and sorrows of school life.
(*b*) The qualities which make a successful business man.
(*c*) The early bird gets the worm.

LATIN.

1. Translate into English *one* of the following passages, and parse all words printed in italics:—

I.

Dant manibus famuli lymphas, Cereremque canistris
Expediunt, tonsisque *ferunt* mantelia villis.
Quinquaginta intus famulæ, quibus ordine longam
Cura penum struere et flammis adolere penates;
Centum aliae totidemque pares aetate ministri,
Qui *dapibus* mensas onerent et pocula ponant.
Nec non et Tyrii per limina laeta frequentes
Convenere, toris iussi *discumbere* pictis.
Mirantur dona Aeneae, *mirantur* Iulum
Flagrantesque dei vultus simulataque verba
Pallamque et pictum croceo velamen acantho.

II.

Volgo totis castris testamenta obsignabantur. Horum vocibus ac timore paulatim etiam ii, qui magnum in castris usum habebant, milites centurionesque quique *equitatui* praeerant, perturbantur. Qui se ex his minus timidos existimari *volebant*, non se hostem vereri, sed angustias *itineris* et magnitudinem silvarum, quae intercederent inter ipsos atque Ariovistum, aut nem frumentariam, ut satis commode supportari posset, timere dicebant. Nonnulli etiam Caesari nuntiarant, cum castra moveri ac signa ferri *iussisset*, non fore dicto audientes milites neque propter timorem signa laturos.

2. Give the meaning of *any two* of the following phrases taken from the prescribed authors:—

Jovis ignis; novissimum agmen; ducere muros; novae res; Cerealia arma; summa belli.

3. Write down the principal parts of the following verbs:—iuvo, ferveo, veho, tango, cupio.

4. Translate into Latin:—

(*a*) He wrote me word that he would come.
(*b*) There was a danger of the enemy's taking the city.

ARITHMETIC.

1. A bankrupt's debts amount to 3,754*l.* 10*s.* 8*d.*, and he is able to pay 7*s.* 6*d.* in the £: find his assets.

2. Two numbers are to each other as $13\frac{1}{2}$ to $17\frac{1}{4}$. If the smaller number be 86·778, find the other.

3. If $\frac{7}{15}$ of a guinea be taken from $\frac{3}{10}$ of $\frac{5}{9}$ of 5*l.*, what fraction of 3*l.* 8*s.* 8*d.* will remain?

4. Multiply 17 tons 10 cwt. 1 qr. 5 lbs. by $13\frac{1}{3}$, and express the answer in ounces.

5. If a man drink 1·75 litres of beer per day, how long will he take to drink 1·295 hectolitres?

6. The length of a man's pace is ·875 metres, and he takes 125 paces in a minute: how many kilometres will he walk in an hour?

ALGEBRA.

1. Divide

$$2x^5 - x^4y - 4x^7y^2 + 5x^2y^3 - 4y^5 \text{ by } x^3 - xy^2 + 2y^3.$$

2. Resolve into factors

$$4x^2 - 25y^2 + 2x + 5y.$$

3. Simplify

$$\frac{(a+b)^2}{a-b} \div \frac{ab+b^2}{a^2-ab}.$$

4. Solve the equation—

$$\cdot\dot{6}x + \cdot 25 - \tfrac{1}{9}x = 1\cdot\dot{8} - \cdot 75x - \tfrac{1}{3}.$$

5. In a mixture of wine and water the wine composed 25 gals. more than half the mixture, and the water 5 gals. less than one-third of the mixture: how many gallons were there of each?

EUCLID.

1. From a given point draw a straight line equal to a given straight line.

2. Describe a parallelogram equal to a given triangle, and having one of its angles equal to a given angle.

3. Define a right angle. Draw a line at right angles to a given line from a point in it.

4. If two triangles have two angles of the one equal to two angles of the other, and a side of the one equal to a side of the other, prove that the remaining angle and sides are equal.

CHEMISTRY.

1. How much potassium chlorate is needed to furnish 1 lb. of oxygen?

[K=39, Cl=35·5, O=16.]

2. A stream of air is slowly led through a glass tube containing bright metallic copper heated to redness. What changes do the copper and the air undergo?

3. Write equations for the production of (*a*) hydrogen peroxide, (*b*) ammonia, (*c*) marsh-gas, (*d*) bleaching-powder.

4. State the laws respecting—

(*a*) The velocity of diffusion of different gases.
(*b*) The volume of a gas when subjected to an increase of pressure.
(*c*) The density of compound gases.

5. From what sources do we obtain sulphur? How are roll sulphur and flowers of sulphur made?

MECHANICS AND PHYSICS.

1. Define the terms "mechanical advantage," "foot-pound," "horse-power."

2. Under what conditions will three forces acting on a rigid body keep it in equilibrium?

3. How could you verify the statement that the intensity or loudness of a sound depends upon the amplitude of vibration of the sounding body?

4. Show that, when the distance of an object placed in front of a convex lens is double the focal length, the image is formed at an equal distance behind the lens.

5. A thermometer is graduated so that it reads 15 in melting ice and 60 in normal steam: convert into Centigrade degrees the readings 20 and 90 taken on that thermometer.

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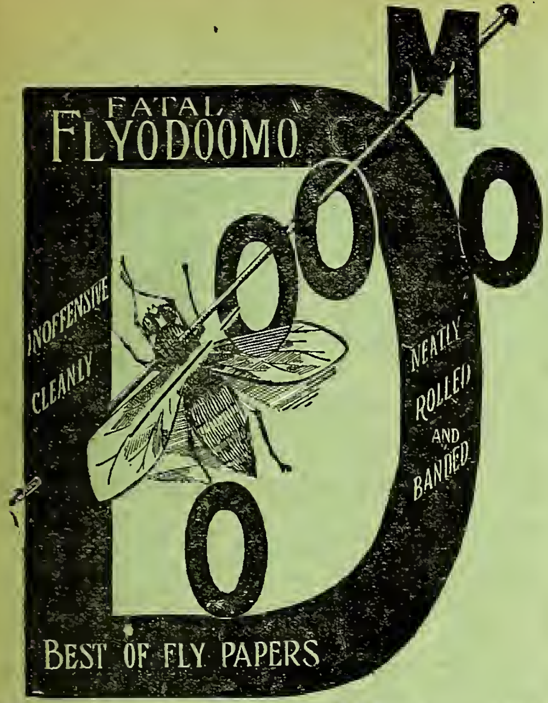

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EDUCATIONAL NUMBER.

THE annual Educational Number of THE CHEMIST AND DRUGGIST will be published on Saturday, September 7. It is a number which has a larger circulation than usual; firms who have goods to sell to students, to schools of chemistry, pharmacy, and medicine, to hospitals and teachers, or to the trade generally, should see that their advertisements are in the number. Instructions should be sent to the publisher as soon as possible, who will supply tariff on application. The number is referred to, and is in demand for educational purposes, during a whole year, which is an additional reason for advertising in it

Summary.

IN PARIS a new system of street first-aid pillar-boxes is being tried (p. 195).

THE judgment in the lanoline trade-mark case in New York is given on p. 196.

IN HAWAII the directions on proprietaries need to be in several languages (p. 195).

THE word "Limited" cannot be abbreviated to "Ld." on the trade-mark register (p. 251).

THE MEDICAL HERBALISTS OF GREAT BRITAIN have been in conference at Sheffield (p. 192).

THE CLOSING EPISODES of the Society of Chemical Industry meeting at Glasgow are told on p. 194.

A CASE in which chloride of zinc was mistaken for honey with fatal results is being inquired into in Paris (p 195).

LORD AVEBURY is satisfied with the result of the House o Lords inquiry into the early closing of shops (p. 192).

MR. GLYN-JONES replies to "Xrayser's" remarks about the financial condition of the P.A.T.A. and C.D.A. (p. 254).

A DRUG COMPANY has been fined 20*l.* and 5*l.* 5*s.* costs for selling peach-nut oil when almond oil was asked for (p. 251).

THIRTEEN POUNDS A MONTH in South Africa is about equal to from 7*l.* 10*s.* to 9*l.* at home, says a chemist's assistant (p. 254).

AN EXPLOSION OF NAPHTHA occurred in Hackney last Saturday, and two persons have died of injuries as a consequence (p. 193).

THE ROYAL AGRICULTURAL SOCIETY is to experiment as to the possibility of the tuberculosis infection of cattle by human beings (p. 192).

DR. KOCH'S LATEST VIEWS on the question of immunity from tuberculosis, and the opinions they have given rise to, are discussed on p. 197.

THE OBSERVATIONS OF "XRAYSER" this week touch on the growth of the drug-trade, the Summer Number, and Mr. J. W. Swan (p. 201).

THIS WEEK'S DRUG-SALES of first-hand goods was one of the shortest on record, and the business done thereat was exceptionally small (p. 255).

THE BRITISH MEDICAL ASSOCIATION is holding its annual meeting at Cheltenham this week. The museum-exhibits are described on pp. 199, 200.

MR. E. SAVILLE PECK presided at the annual meeting of the Federation of Local Pharmaceutical Associations held at Dublin this week. The officers for the past year have been re-elected (p. 250).

THE TELEPHONE COMPANY'S CASE against Messrs. Davis for a telephone subscription ended in the Company's claim being allowed, whilst the defendant obtained 20*s.* on his counter-claim (p. 251).

AT the quarterly *comitia* of the Royal College of Physicians, held in London last week, several by-laws amended in conformity with the revised regulations of the Examining Board were re-enacted (p. 192).

THE Birmingham tr. benz. co. case came on again last Friday. The certificate from Somerset House said the sample was of Pharmacopœial strength, and eventually the summons was withdrawn, costs being allowed to the defendant (p. 251).

AN IMPORTANT REDUCTION IN BISMUTH SALTS is a feature of the markets this week. Three leading American roots—viz., golden-seal, senega, and serpentary—have been advanced owing to scarcity. Ergot is again lower. Quinine has been dull throughout (p. 255).

THE BRITISH PHARMACEUTICAL CONFERENCE has been in session this week at Dublin. The presidential address begins on p. 209, and the twenty-two papers on pharmacy subjects, which were read at the meetings, on p. 221. The Conference is to meet at Dundee in 1902, the invitation being conveyed by Messrs. Kerr and Naysmith (p. 246).

A New Book.

WE have reprinted our DIARY monograph, "Opening a Pharmacy" in book form, uniform as to binding with the "Art of Dispensing." The price is 1*s.* net, or 1*s.* 1*d.* post free. It is a most useful book for those who contemplate starting in business as chemists and druggists.

English News.

Local Newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

Brevities.

Six samples of drugs were taken in Lancashire last quarter for analysis, and all were found to be free from adulteration.

At Sandwich on July 29, Henry Wood, chemist, was fined 5*s*. and 10*s*. costs for selling mercurial ointment not of B.P. strength.

The basement of the premises of Messrs. Arnfield & Co., chemists and druggists, 7 Lower Hillgate, Stockport, was flooded on July 20 owing to the heavy rain.

The case of John Henry Nicholson, the "aural specialist" (*C. & D.*, July 27, page 112), came on again on July 27 at Brentford, and he was committed for trial.

An inquiry was held on July 27 as to the death of Luke Cox, a stoker at the Morgan Plumbago-crucible Works, Battersea, who was scalded by the bursting of a steel copper-expansion.

Mr. Tinker, assistant to Mr. Abraham, chemist and druggist, Long Sutton, was opening a bottle of ammonia on July 27 when the liquid spurted into his face and eyes, causing painful injury.

The publicans of Penrith are objecting to the increase in the price of aërated waters which the local manufacturers have made, and also the deposit required of ½*d*. per bottle and 3*d*. on each syphon.

For stealing four fish-plates, two iron pins, and 28 lbs. of scrap-iron, value 5*s*, belonging to Messrs. Chance & Hunt, chemical manufacturers, Wednesbury, two women were sentenced, the first to one month's imprisonment, and the second to fourteen days.

Royal College of Physicians.

The ordinary quarterly *comitia* of the Royal College of Physicians of London was held on July 25, the President, Sir William Church, M.D., LL.D., occupying the chair. The following Fellows were elected officers of the College:—Censors, Thomas Tillyer Whipham, M.D., Sir Dyce Duckworth, LL.D., M.D., Thomas Henry Green, M.D., George Vivian Poore, M.D.; treasurer, Sir Dyce Duckworth, M.D.; Emeritus registrar, Sir Henry Pitman, M.D.; registrar, Edward Liveing, M.D.; Harveian librarian, Joseph Frank Payne, M.D.; library committee, Samuel Gee, M.D., J. Wickham Legg, M.D., Norman Moore, M.D., William Henry Allchin, M.D.; curators of the museum, W. Howship Dickinson, M.D., H. Charlton Bastian, M.D., William Cayley, M.D., John Abercrombie, M.D.; finance committee, T. Tillyer Whipham, M.D., A. Lewis Galabin, M.D., and Stephen Mackenzie, M.D. The Baly gold medal, instituted in 1866 by Dr. Dyster, of Tenby, "In memoriam Gulielmi Baly, M.D.," which is awarded every alternate year on the recommendation of the President and Council to the person who shall be deemed to have most distinguished himself in the science of physiology, especially during the two years immediately preceding the award, was awarded to Frederick William Pavy, M.D., F.R.C.P., F.R.S., of Guy's Hospital.

The following by-laws, amended in conformity with the revised regulations of the conjoint Examining Board, were re-enacted as follows.—

> Every candidate for the College licence (unless specially exempted) shall be required to produce satisfactory evidence of having passed before the commencement of professional study a Preliminary examination on subjects of general education recognised by the College.
>
> Every candidate shall be required to produce satisfactory evidence of having completed five years of professional study, after passing a recognised Preliminary examination before admission to the final examination.
>
> A candidate shall not be admitted to the second examination until the completion of two winter sessions and one summer session (or fifteen months during the ordinary sessions) at a recognised medical school, nor until the expiration of one winter and one summer session after passing Parts I. and III. of the first examination.
>
> A candidate shall not be admitted to the third (or final) examination till the expiration of five winter and five summer sessions from the date of passing the Preliminary examination, and of four winter and four summer sessions after passing Parts I. and III. of the first examination, and of two winter and two summer sessions after passing the second examination.

Public Health Congress.

The Public Health Congress was held at Eastbourne last week. Dr. A. Newsholme, medical officer of health, Brighton, devoted his presidential address to the consideration of preventive medicine and the possibilities of bacteriological work. On July 26 Dr. Koch, of Berlin, gave an address on "Malaria." He quoted German army statistics to show the immense reduction which has taken place in the number of malarial cases since quinine has been used as a prophylactic. The native population of the colonies should, Dr. Koch said, be able to procure the drug as cheaply as possible by means of quinine-dispensaries.

Early-closing.

Lord Avebury has addressed the following letter to the Secretary of the National Association of Grocers' Assistants in reference to the recent House of Lords early-closing inquiry:—

> We have, I think, every reason to be gratified by the House of Lords report. They adopted the whole of my draft unanimously, though they modified the operative recommendation at Lord Salisbury's suggestion. This is now his own proposal, and I do not doubt that he will act on it. Provisional orders are rarely opposed, and I do not suppose these would be. They go through almost as a matter of course. Still the proposal seems to me unnecessarily cumbersome. I am, however, not without hope that, when the details come to be considered by the Executive, their part of the plan may be modified. The shopkeepers' associations gave us most valuable support, and their evidence convinced the committee that they are genuinely and honourably anxious that the assistants should be relieved from the present grievously long hours, and that they will take the necessary steps if Parliament place it in their power to do so.

Herbalists' Conference.

The thirty-sixth annual conference of the National Association of Medical Herbalists of Great Britain was held on July 25 at Sheffield. Mr. S. Halliday (Cleckheaton) presided. The following members were also in attendance:—Messrs. T. Ogden (Dewsbury), J. W. Scurrah, T. Allen (Bradford), J. Tildesley (Parkgate), H. Blunt (Birmingham), H. R. G. Skelton, J. S. Ward, C. Darlington (Sheffield), O. H. Hassell, J. Greenhall (Manchester), J. Mansell (West Bromwich), C. Burden (Worcester), W. Webb (Southport), H. A. Potter (London), W. P. Shaw, R. F. Richardson (Nottingham), E. Haigh (Wakefield), J. Simmons (Goole), P. Dawson (Buxton), J. Slater (Leicester), W. Gardiner (Llamannan, N.B.), Rowley, Thompson (Glasgow), J. Burgon, G. Stubbs (Stockport), T. Galloway, G. Birtwistle (Halifax), S. Kaye (Huddersfield), J. Clarke (Liverpool), G. Clarke (Shipley), Purdue (London), N. Whittell (Heckmondwike), J. B. Keswick (Ilkley), F. L. Pickering (Congleton). Mr. D. Beardall (Nottingham) sent a collection of rare herbs.

Tuberculosis Prevention.

At a meeting of the Council of the Royal Agricultural Society on July 31, the Veterinary Committee, in view of the statements made by Dr. Koch at the Tuberculosis Congress last week as to the immunity of cattle against human tuberculosis, recommended that experiments be forthwith made at the Royal Veterinary College as to the possibility of infecting bovine animals with tuberculosis material from the human subject, and that 250*l*. be placed at the disposal of the Veterinary Committee for such experiments. It was proposed that the experiments be conducted by a subcommittee consisting of Lord Arthur Cecil, Lord Brougham, Sir Nigel Kingscote, Mr. Victor Cavendish, M.P., and Mr Harold Swithinbank. The recommendation was adopted.

Birmingham Notes.

The case of Blair *v*. Southall (Limited) for wrongful dismissal, which was set down for hearing at the Birmingham

Assizes which are now being held, has been settled out of court by mutual consent.

The fund for founding a scholarship at the University of Birmingham in memory of the late Alderman S. Theodore Mander, chemical-manufacturer, Wolverhampton, who died during his mayoralty, amounts to 800*l.* The scholarship will be open to the sons and daughters of the burgesses of Wolverhampton.

The compound tincture of benzoin case caused a gathering at the Law Courts of the pharmacy clans. They seemed very well satisfied with the results, for about a dozen adjourned to a well known hostelry and partook of an elaborate lunch to commemorate. Mr. Ward and Mr. Glyn-Jones represented London.

What a pity the F. & D. inspectors do not ring the changes more! Of three pharmacists who were present to hear Mr. Barlow's case, each had supplied this article no fewer than three times. There must be a great demand for it at the Corporation stables or elsewhere.

A curious method of dealing with the orders of the F. & D. inspector is recorded. A drysalter having his doubts about the strength of his ol. camph. accidentally (on purpose) smashed the bottle, spilled the contents, and apologised to his unwelcome customer, saying that it would be some time before he could supply him, as that was all he had, and he would have to prepare a fresh batch.

Mr. J. W. Oliver, on July 25, was presented with an address and cheque, the gift of his students and friends, as a token of their appreciation and respect. Mr. Oliver has taught the botany classes at the Midland Institute and Technical School for twenty-nine years, and has made many friends in pharmaceutical circles.

In spite of the great value and attractiveness of the Edgbaston Botanical Gardens, in which Professor Hillhouse as Hon. Secretary takes such great interest, they seem to be languishing for want of support and funds, for there is an adverse balance of 145*l.* and 310 fewer members than last year. It would be an act of grace if our local Association contributed an annual subscription, for its students derive much benefit therefrom, and it would identify itself thereby with botanical education.

The mighty Summer number of the *C. & D.* has astonished many of the pharmacists of our city during the past week-end. They ask how it is done, and no doubt Mr. Editor and Mr. Publisher smile at their sweet innocence. One was so proud of it that he was seen "doing" Corporation Street and New Street with it under his arm, at a time when these places are the most thronged with people.

A Noisome Smell.

Mr. Ashford, for the Aston Urban District Council, mentioned at the Aston Police Court on July 26 that the nuisance arising from the manure-works of Messrs. Ginster & Sons, at Erdington, had not yet abated. Judgment had been deferred against Messrs. Ginster, he added, pending the carrying out of an undertaking to cease the works. Inspector Deeks stated that though no work seemed to be proceeding a large quantity of manufactured manure was on the premises, which gave off a noisome smell, capable of being detected more than fifty yards away. The Bench granted an adjournment for six weeks in order that the premises could be cleared, and on a promise that no manufacturing should be done in the meantime.

Fire.

On July 24 a slight fire broke out at Messrs. Magor's Drug-stores, High Street, West Bromwich. It originated in a shed at the rear of the main building, in which was a large quantity of straw and other things. After a time the flames were subdued, and no very serious damage seems to have been done.

Workhouse Drugs.

The Local Government Board's recommendation that all medicines and drugs required for use in workhouses should be provided by Boards of Guardians instead of by medical officers out of their salary, was considered by the Stamford Board on July 26, and it was decided to reply that the Guardians were satisfied with the existing arrangements.

The same question was discussed by the East Ward Board of Guardians, Appleby, on July 27. The medical officers had been asked for their opinions on the subject. One considered that the doctors should pay for the drugs, but that the salary should be fixed so as to include the cost. The other was of opinion that the medical officers should be granted a stated sum each year for drugs. The Chairman (Mr. Boazman) said the idea of the Local Government Board was that if the matter was left to the medical officers the expensive drugs would not be supplied; and the Clerk said they could rely on the doctors doing what was right. Eventually a committee was appointed to draw up a list of expensive drugs and medicines and submit to the Board.

Fatal Explosions.

The floods caused by the heavy rains of last week were the indirect cause of a fire and explosion at Hackney Wick on July 27. The naphtha-distillery of Messrs. Carless, Capel & Leonard, White Post Lane, Hackney, was flooded, and the water, finding its way into the wells in which the naphtha is stored, forced the naphtha to float into the adjoining streets. Men were stationed at different points to warn passers-by not to light matches, and the residents of the flooded houses were cautioned not to leave naked lights exposed, but in spite of these precautions a lighted match was thrown down, and an explosion occurred. Many windows in the neighbourhood were blown out by the force of the explosion, whilts the flames quickly attacked the woodwork, and set a row of cottages on fire. The naphtha on the water was speedily burnt away, but it was some time before the fire in the houses was got under. When the floods subsided the fire brigade washed down the streets to remove all traces of naphtha. Over a dozen persons were injured, and two have since died.

At Barry on July 26, a barrel of paint was being lowered into the Austrian steamer *Marianne* when it exploded. The contents fell on some boiler-makers below, and caused a fire. Three men were burnt to death, and a lad was severely injured.

Cricket.

Reynolds & Branson's Cricket Club.—A match was played on July 17 and 18 between two teams chosen from the firm of Messrs. Reynolds & Branson (Limited), Leeds, for a silver challenge cup. Mr. G. Lazenby's XI. scored 95 and Mr. W. Batteriss' XI. 60.

Poison-distribution.

At Thames Police Court on July 30, Robert Young, druggist's assistant, was summoned, at the instance of the Society for the Prevention of Cruelty to Animals, for placing a quantity of poisoned meat in a garden. Evidence was given by a neighbour of the death of her goat and three cats, and another witness deposed to the death of his dog and cat. Defendant said he poisoned his own cat in his own yard with strychnine contained in a piece of meat. He obtained the strychnine crystals from his employer's premises. He denied putting poisoned meat on the wall. A fine of 20*s.*, and 2*l.* 2*s.* costs, was imposed.

At Grays, Essex, on July 26, Frederick Hasling was charged with attempting to administer poison to two women and a man. Five witnesses gave evidence to the effect that while drinking pots of ale at the village inn, the prisoner joined them, and producing a large packet, containing what was subsequently proved to be a poisonous mixture, sprinkled it over the table upon which the ale-pots stood. There was insufficient evidence to justify committal, but the Chairman of the Bench told the prisoner "not to do it again."

The Week's Poisonings.

Since our last report eleven fatalities from poisoning are recorded, three being caused by unscheduled poisons—paraffin-oil, butter of antimony, and salts of lemon respectively. In the "scheduled" list four deaths were caused by taking carbolic acid, two by taking laudanum, one by oxalic acid, and one by solution of morphia.

"The Art of Dispensing."—A subscriber in Mussoorie, writing on June 24, says of the new and enlarged edition: "I was surprised at the amount of information it had, also what I was ignorant of. Now, however, we go to the "A of D." for every other prescription, and it *always* helps."

Irish News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor.

Dispensership Vacancy.

Notice of motion has been given that the compoundership of the Grand Canal Street Dispensary of the South Dublin Union be declared vacant, owing to the continued absence in South Africa of the present compounder.

Aëration Beginning.

The premises, 68 Grafton Street, Dublin, formerly in the possession of Mr. J. E. Brunker, L.P.S.I., ex-President of the Pharmaceutical Society of Ireland, where he carried on business as Anderson & Adams, have been acquired by the Super-Aëration Company, Dublin.

Street Accident.

At Dublin on July 27, John Behan, in charge of a horse and lorry belonging to Messrs. McMaster, Hodgson & Co., wholesale chemists and druggists, Capel Street, was thrown off, and the wheels of the vehicle passed over his legs. He was conveyed to Jervis Street Hospital.

Dublin Chemist's Death.

On July 30 the inquest was resumed as to the death of Mr. W. B. Murray, pharmaceutical chemist, 139 Stephen's Green, Dublin. Further evidence—medical and lay—was given as to the cause of death, but eventually the jury returned a verdict that death was due to injury to the cervical vertebra of the spine.

Corrosive sublimate Poisoning.

An inquest was held on July 26 on the body of a woman who died at the Limerick District Lunatic Asylum from the effects of corrosive sublimate, self-administered. The husband of deceased used corrosive sublimate for veterinary purposes.

Dr. J. Leonard's Will.

Probate of the will of the late Dr. J. Leonard, 19 North Earl Street, Dublin, who died on June 23, was granted on July 25 to Mr. John Crowley, solicitor, the sole executor named therein. The personal estate of the testator has been sworn at 24,418*l.* 0*s.* 4*d.* Amongst the bequests are 250*l.* to the Rev. Mr. Ridgeway, to be applied in charity; 200*l.* to the deceased's faithful servant, Eliza McGrane; and 2,000*l.* to his friend, Dr. J. C. McWalter—his residuary estate to be divided between his brother Richard and four sisters.

A Libel Action.

Mr. Patrick N. White, pharmaceutical chemist, Sligo, was the defendant in a libel action at Belfast Assizes on July 31. The case is one in which Mr. White is alleged to have libelled the plaintiff, a Sligo solicitor, in a resolution passed by the Sligo Board of Guardians, of which defendant is Chairman. Three trials of the action have taken place at Sligo, but in each case the jury disagreed. The case was not concluded on Wednesday.

The Drug-Trade in Siberia.—An interesting paper on this subject by Mr. L. Lodian appears in a recent issue of the *Druggists' Circular*. The writer states that throughout the length of the Siberian railroad Government pharmacists and physicians are stationed at distances ranging from fifty to eighty miles, and these minister to the railway employés and passengers alike without charge. The work is done in a most perfunctory manner, and the pay is about 10*l.* a month for physicians and for pharmacists. The few drug-stores found in Siberia are, according to the author, inferior in their appointments and practice. The principal supplies of drugs are obtained from German sources, while surgical apparatus is generally of French origin. Mr. Lodian met with no drugs or appliances of English or American make in the course of his travels.

Scotch News.

Local newspapers containing marked items of news interesting to the trade are always welcomed by the Editor

Society of Chemical Industry.

The annual dinner of the Society was held on Thursday, July 25, in the Windsor Hotel, Glasgow. Covers were laid for 106, the function being presided over by Mr. Joseph W. Swan (President). Mr. Swan was supported by Lord Provost Chisholm, the Very Rev. Principal Story, D.D., Sir Robert Pullar (Perth), Sir Thomas Wardle, Professor Lang (Toronto), Mr. Clifford Richardson (New York), Mr. Levinstein (Manchester), Dr. Caird (Greenock), and Mr. T. Tyrer. The vice-chair was occupied by Mr. G. Beilby (ex-President). Among others present we observed Mr. N. H. Martin (Newcastle-on-Tyne), Mr. R Macadam (Glasgow), and Mr. T. Maben (Glasgow).

After the loyal toasts had been drunk, Mr. Levinstein proposed "The Society of Chemical Industry," and in doing so referred to some things that might be done in the way of making use of some of their surplus funds, such as issuing the journal weekly or fortnightly. The President replied in an exceedingly happy speech, in which he spoke eloquently of the past and hopefully of the future of the Society.

"The Guests" were toasted on the call of Mr. Beilby, Lord Provost Chisholm and Principal Story replying. The Lord Provost said there were some questions he would like chemistry to answer—namely, how to get rid of the black smoke, how to utilise sewage-sludge, for which he had tried to induce the Town Council to offer a premium of 1,000*l.*, and some similar conundrums. Mr. Tyrer proposed "Kindred Societies," which was replied to by Dr. Caird (of the Engineering Society) and Dr. Fergus (of the Philosophical Society). The healths of Mr. Cresswell (Secretary), Dr. Gray (Local Secretary), and Mr. Tyrer were also drunk enthusiastically.

The excursion took place on Friday, July 26, a special steamer being chartered for a sail down the Clyde. The day was magnificent, and everything passed off well, special praise being due to the caterers, who did their part to perfection. A very successful photograph was taken of the group, and everyone returned carrying away only pleasant associations of the annual meeting of the Society.

Veterinary Conference.

The Conference of the National Veterinary Association was opened on July 30 at Edinburgh. At the dinner in the evening, Professor Fraser, in replying for the medical profession, referred to Professor Koch's remarks on the transmission of tuberculosis, and said that without attempting to criticise the views which had been brought before them by a very eminent bacteriologist, whose opinions must always command respect, he thought these statements were merely the unconfirmed views of a single observer, and on whatever pinnacle of fame he might stand he was undoubtedly liable to all the faults which were incumbent on the human race and might at any moment make observations which were not altogether in conformity with after-consideration. That had been so in the history of medicine and bacteriology—even in the biographical history of the gentleman referred to. A similar statement was made in South Africa with regard to plague bacillus in rats. That had been shown to be untenable, and he felt certain that the first views would also be confirmed in regard to tuberculosis—that the disease was transmissible from lower to higher animals.

Edinburgh Pharmacy Golf Club.

The fourth monthly competition for the "Dick Handicap Medal," which was played over the Braids last week, was won by one of the scratch men—Mr. John Jas. Sutherland.

Laudanum Again.

At Edinburgh last week, a middle-aged woman, Alexandrina Rae, who was said to be a confirmed laudanum-drinker, was sentenced to six months' imprisonment for having stolen several articles of furniture from a house where she acted as caretaker. On behalf of the accused it was stated that the effect of the laudanum-drinking had prompted her to commit the offences.

French News.

(From our Paris Correspondent.)

A Research Fund.—A law has just been promulgated here for creating a fund for scientific researches, with the object of encouraging scientific research relative to the discovery of new methods for treating diseases of man and animals, and the discovery, outside the domain of medical sciences, of the laws regulating the phenomena of nature (chemistry, natural history, physics, astronomy, &c.). The fund will be managed by the Ministry of Public Instruction, and will be financed from various sources, including a State subvention, as well as a percentage of the profits of the "mutuel" betting system.

Outdoor Hygiene.—Of course visitors to Paris have seen the anti-spitting notices everywhere—in railways, tramcars, omnibuses, waiting-rooms, &c.: "On est prié de ne pas cracher par terre." The form varies, but this is the usual one. For pure elegance the Boston, U.S.A., form is hard to beat: "The Board of Health hereby adjudges that the deposit of sputum in street-cars is a public nuisance." Nevertheless I saw a better while waiting in a provincial post-office the other day. There was before me a long notice describing the terrible results that might follow if I expectorated. I read it from beginning to end because it was put in such an interesting and informative way.

First Aid.—A new apparatus for rendering first aid in cases of street-accidents is now being tried in Paris. It is something after the style of a pillar letter-box, and contains a small medicine-chest and a folding stretcher. In order to get at these objects it is necessary to break the glass, in the same way as when calling a fire-engine. In this way the key of the case and access to a telephone inside communicating with the ambulance-station is obtained. There are only two of these apparatuses fitted up so far, but if their use is extended they will do a good deal towards relieving the Paris pharmacies, which have long been recognised as the places where injured persons or those taken suddenly ill should be conveyed. It may be added that assistance is always cheerfully given, but, from a business point of view, such customers are usually a source of loss, if anything.

The Wrong Jar.—On July 31 Mlle. Leullier, a nurse of the Lariboisière Hospital, also the lady superintendent of the woman's ward and the director of the hospital, were put on their trial for causing the death of a female patient by imprudence. The nurse used chloride of zinc instead of honey in preparing a lotion, and she admitted the error. The lady superintendent pleaded that she found things in the state they were on entering the hospital, and it was not her business to change them. The labels were more or less illegible. Dr. Duguet, physician at the hospital and professor at the Faculty of Medicine, said it appeared to him incredible when he heard of the accident. The jars had been kept in the cupboard without his knowledge and unknown also to the chief pharmacist of the hospital. The chloride of zinc was used as a disinfectant. The trial is proceeding.

The Pharmacist in History.—"Les Tronçons du Glaive" is an historical novel of the 1870–71 war, from the proclamation of the present French Republic to capitulation of Paris, by Paul and Victor Margueville, sons of the General of that name, and contains on page 134 a description of Bordone, of the Dijon Army Corps, an ex-pharmacist, and Garibaldi's second in command. This is the reference:—

> The door opened, and there entered a tall handsome man, pinched in a scarlet shell-jacket, trimmed with astrachan, and relieved by gold epaulettes. Fair, with grey eyes, an insolent and intelligent mien—it was the lord of the place, the chief of the staff, Colonel Bordone, ex-Surgeon of the French Navy, then pharmacist at Avignon, one of Garibaldi's "Thousand," having Italianised his name of Bourdon, carrying off-handedly the three convictions to fines and imprisonment which the Courts had awarded to him for assault, embezzlement, and theft. . . . Entirely null in a military sense, clever administrator, he abused the power (which his aplomb and activity gave him) over the General for his own profit, deciding everything, and carrying things with a high hand.

Colonial and Foreign News.

Californian Quicksilver.—A large vein of rich cinnabar ore has been struck in the Rinconnadu quicksilver-mine, east of Santa Margarita, California, and the ore is thought to carry about 10 per cent. of quicksilver. The whole vein is 80 feet wide, but the latest strike only 20 feet. The mine is worked on a very small scale, its one retort handling only a ton of ore a day.

Biggest Cheque in Japan.—According to the *Straits Budget*, a cheque lately drawn by the Bank of Formosa at the request of Messrs. Samuel, Samuel & Co., is the biggest thus far known in Japan. The cheque was for 1,177,410 yen (1 yen = 2*s.* 0½*d.*), and was used for paying the price of camphor which they, as sole agents, had purchased from the Japanese Government.

A British Guiana Combine.—It is reported in Georgetown, British Guiana, that several leading chemists and druggists in the colony are considering a scheme to amalgamate their businesses as a limited-liability company under the Companies Ordinance. Particulars have not been disclosed, but it is thought that the combination will be composed of the following:—Messrs. Scott & Co.; Klien, Amson & Co.; Van Nooten & Co., of Georgetown; and Messrs. Isaacson & Co., New Amsterdam, Berbice.

Progress in Paraguay.—A contract has been made with a large landowner at Asuncion for the establishment of a quebracho-factory, for the production of extract of quebracho, for use in tanneries. Another plant, known as "curupay" (the American Consul at Asuncion is informed), gives even more tannic acid than the quebracho—the yield being as high as 36 per cent.—and, in his opinion, a factory for its utilisation would prove an excellent investment. As yet the scheme has never been tried.

Mediterranean Sponges.—The sponge-fishery off the coast of Tripoli last year was the most successful that has ever taken place, the quantity gathered not only being great and the quality good, but the profits realised gave every satisfaction. Sponges valued at 43,000*l.* were landed and subsequently exported, 32 500*l.* worth were taken to Greece without being landed, and 2,000*l.* left in stock. During the fishing season a Greek Government transport or hospital-ship was stationed at Tripoli, on which all divers and Greek seamen who had sustained injury in searching for sponges were received and properly treated.

Hawaiian Pharmacy.—In a recent issue of the *Spatula* Mr. R H. Bowman, of Hilo, Hawaii, writes of the condition of pharmacy on that island. American patent medicines (such as Chamberlain's and Ayer's preparations) have, he says, a good sale amongst the natives, and the Kickapoo medicines are likewise popular. There are two American drug-stores in Hilo, besides a number of Japanese and Chinese druggists, who do considerable business in their own way. The pharmacists' customers are composed of whites, Japs, Chinese, and Portuguese, besides Hawaiians and numbers of Porto Ricans are going there to the plantations. Several languages are therefore necessary, and this is an example of the composite style on labels:—

> Dose—1/3 to one teaspoonful in tea or poi at bedtime for a physic.
> For small children give our sweetened castor oil.
>
> 1/3 iloko oka puna ki piha, iloka oka ki, poi paha, ika manawa e moeai no ka lapaau.
> No na keiki liilii haawi hookahi puna aila momona.

The inevitable soda-fountain is appreciated, and the cigar and photographic departments are by no means to be despised even in Hawaii. But goods have to be ordered well beforehand, for it takes two months or more before orders can be executed from San Francisco. All freight is sent by sailing vessels, which leave San Francisco every three weeks. The wharfs at Hilo are not long enough for ships, so scows are used for landing the goods. The Japanese drug-stores are well stocked with a big assortment of Japanese patent medicines, but American medicines are often used by the Japs. They appear to have great faith in the curative properties of porous-plasters.

American Notes.

(From our New York Correspondents.)

When the Lanolin Trade-mark Case was called, and the witnesses and spectators filed into the Court-room, one of the latter glanced at the Judge (Justice O'Gorman) and remarked, "Its all up with the Britishers." The Judge is President of the Ancient Order of Hibernians.

The Tarrant Fire Again.—Thomas F. Main, president, and W. V. V. Powers, director of the drug-firm of Tarrant & Co., whose establishment blew up last October, in consequence of a fire which ignited some 6,000 lbs. of potassium chlorate, were indicted for manslaughter last week and admitted to bail in $2,500. The indictment is based on the fact that the firm stored more explosive chemicals than were allowed by the regulations of the Fire Department.

Fluorine in Beer.—In the *New York Medical Journal*, July 6, Dr. Fritz Schwyzer, of St. Francis Hospital, reports a case of a patient suffering from painful swelling of the legs and intense pain in the abdomen, and, later, swelling of the lower part of the body from thrombosis of the iliac vein. The patient was accustomed to drink considerable quantities of beer, and research showed the symptoms to be due to excess of fluorine in the system. The beer was examined and found to contain fluorides added as preservatives. Dr. Schwyzer concludes that fluorine is a cumulative drug, and that it should never be used as a preservative for foodstuffs.

The Scientific Apiarist.—"Darwin Outdone" is the title given to an article describing a method of increasing the bees' yield of honey. The process is said to be of French origin, and depends on the more or less established statement that the longer the bee's tongue the greater its honey-gathering capacity. The "glassometer" has been designed to aid the apiarist in developing a long-tongued race, and consists of a glass vessel for syrup with a lid containing a number of perforations, and a scale to show the height of the liquid when the bees just reach it through the holes. It is estimated that the ordinary bee can suck nectar from a depth of $\frac{1}{4}$ inch, and that the new apparatus will increase its range about $\frac{1}{25}$ inch.

British Lanoline Case.—Jaffé *v.* Evans (acting for the Lanosoap Company, Limited, Bradford). The following is the judgment delivered by Mr. Justice O'Gorman on July 16 :—"Plaintiffs and their assignors, for twenty years prior to 1896, had, through certain patents, a monopoly in the manufacture of a purified wool-fat used in ointments, salves, and soap, which product they designated 'Lanoline.' Since 1896 they have used the same name as a trade-mark, and this action is brought to restrain the defendants from applying the name to their product, which is substantially similar to the one covered by the plaintiffs' patents, and is sold as 'British Lanolin Hydrous' and 'British Lanolin Anhydrous.' The action cannot be maintained. Upon the cessation of the monopoly created by the patents the plaintiffs reserved no exclusive right to the manufacture of their product or to the use of its identifying and generic name. Upon the expiration of the patents the name, as well as the right to manufacture and sell the product, became public property, and no trade-mark right exists or could be acquired by subsequent use (Singer *v.* June 163 U.S., 169). The name was the property of the patentee only during the life of the patents, and to permit its exclusive retention thereafter would practically extend the monopoly indefinitely. That somewhat similar articles produced by other processes were known by other names during the period covered by the patents is entirely immaterial. Lanoline was then exclusive property, and competitors were driven to the employment of other names for their goods to escape the imputation of infringement of rights under the patents; but now, the patents having expired, the commodity and process, and the scientific or descriptive term by which it was designated by the plaintiffs, and by which it has become universally known, have passed to the public, and the plaintiffs are not entitled to the relief which they seek in this case. The allegations as to deception and unfair competition are without evidence to support them, and the complaint must be dismissed, with costs."

East Indian News.

Mr T. Bliss, of Messrs E. Plomer & Co., Lahore and Simla, goes home this week on his "annual" trip.

French Colonial Tariff.—The Finance Department of the Government of India issue a notice this week intimating the prolongation of the present minimum tariff with France till February 23 next.

Bacteriological Institute for Bombay.—The Government of India intend establishing a large bacteriological-research institute with a laboratory at Parel under Dr. Haffkine, who will be known as director of bacteriology.

Medical Students on Strike.—The students of the Grant Medical College, Bombay, to the number of 400, have been on strike this week as a protest against the punishment of two of their number by the principal of the college for writing upon walls of rooms.

Indian Opium-auction.—At the Government opium-sale at Madras in July, 2,000 chests each of Behar and Benares opium were offered, and found purchasers. The average price for the former was 1,364r., and for the latter 1.332r. per chest. The proceeds of the sale aggregated 53,95,000r.

India's Foreign Trade.—The trade-returns for the first two months of the current financial year show remarkable expansion under both export and import headings, the former having gone up in value by $4\frac{1}{4}$ crores of rupees (mainly owing to an increase in the shipments of raw cotton and oilseeds).

Hints on East Indian Trade.—The American Consul at Coburg calls attention to the fact that among American and European firms catering for the East Indian trade there has been a tendency of late to do business direct with native importers. While this setting aside of the established commission houses at the seaports promises on the one hand an advantage, in so far as a large business may be expected by direct dealing with the natives, it has on the other hand very serious drawbacks, owing to the fact that in the East Indies no law exists for the registration of firms, and it is often impossible to ascertain by what persons a concern is owned. Information regarding the standing of a native concern is of little value, as, if fraud be intended, the owner of the concern can say that he is only the agent for some other person. The bazaar at Bombay is open for a good many articles, but careful study of the goods wanted is required; first-class products are not so much in demand as cheap and showy ones.

Mysore Sandalwood Oil.—In reference to the rumours in London that a monopoly had been obtained by the East India Association (Limited) for securing the whole production of Mysore sandalwood, Messrs. Schimmel & Co., Miltitz, announce by circular that they are requested by Mr. J. L. Pigot, Conservator of Forests in Mysore, to meet the aforesaid unfounded rumours by the following notice :—

Government of Mysore,
Office of the Conservator of Forests in Mysore.
Bangalore, June 10, 1901.

Notice.

Notice is hereby given that sandalwood of all descriptions, including classes Nos. 13 to 18, which were reserved from public sale in 1900, will be sold as usual by auction at the close of the current year. Details of the quantities to be offered for sale will be notified in due course.

(Signed) B. Heerasingh,
for Conservator of Forests in Mysore.

In further explanation Mr. Pigot adds that the concession once granted to the East India Association (Limited), for the exclusive rights to distil sandalwood in Mysore, has lapsed and will not be renewed, which confirms the statement published in the *C. & D.* of July 20, page 78.

A Greek Firm has obtained permission to seek for sponges off the coast of Bastia, Corsica, and has commenced operations with four vessels well equipped with diving apparatus.

The British Congress on Tuberculosis.

By A Member Thereof.

THE views brought forward by Professor Koch in respect of the non-transmissibility of animal tuberculosis to man and *vice versâ* (*C. & D.*, July 27, page 124) seem to have had a very disturbing influence on the proceedings as a whole. A very large proportion of the papers set down for discussion bore on the methods of rendering innocuous the meat and milk of contaminated animals, of preventing the sale of such products, and of demonstrating the lethal effect of such articles of food on the health of the people. Then, again, the burning question of compensation to cattle-owners for the slaughter of condemned animals was to have been discussed in the interests of "the trade," for these gentlemen cling obstinately to the conception that the public ought to be made to pay for animals which are unfit for food whether eaten or not. The pretension is a tempting one for brisk criticism, but under existing circumstances it hardly seemed worth while discussing because, after all, it may turn out that, except in extreme cases, no particular danger to the public accrues from eating the flesh and drinking the milk of animals which are the subjects of localised tuberculosis. Inspectors, no doubt, will continue to condemn animals afflicted with general tuberculosis in virtue of the general principle that the meat of diseased animals—no matter what the disease—ought not to be sold for consumption all the more if it belongs, or belonged, to a "consumptive" animal.

It was impossible to allow Professor Koch's views to pass unchallenged, and in an incredibly short space of time Professor MacFadyean, of the Royal Veterinary College, prepared a paper in which he traversed the assumption that because human tuberculosis cannot readily be conveyed to animals, therefore that bovine tuberculosis is not a source of infection to human beings. Although Koch's assertion that cows are not susceptible to inoculation with human tuberculosis may be true in the main, it really only amounts to the fact that they are not easily infected, for there is abundant evidence that it is possible. That, after all, is of comparatively little moment. What we are interested in knowing is whether the ingestion of tuberculous milk and meat may not give rise to the disease as it is met with in man. Unfortunately for science, recourse to experiment, which would settle the matter right off, is not permissible, so that we are reduced to observation and surmise. We know, for instance, that the virus of smallpox can only be inoculated in calves with the greatest difficulty, but it can be, and has been, accomplished, and the disease in the calf is readily communicable to human beings in the form of vaccine. This fact shows that it is not safe to argue on the principle of *vice versâ*. We know that the virus of various diseases in one set of animals is very apt to have its virulence increased or diminished by passage through the organism of some other animal, and it may be so with tuberculosis in such wise that the bacillus, by its passage through man, is modified to such a degree that it is no longer capable of infecting the cow.

In adult life tuberculosis, in the vast majority of cases, attacks the lungs; hence it is assumed, possibly on rather slender foundation, that the microbe obtains access to the organism *viâ* the respiratory passages. In the young, and especially in the very young, whose nourishment consists mainly of milk, intestinal tuberculosis is frequently the so-called *tabes mesenterica* Applying the same argument, this form of tuberculosis may be assumed to be of alimentary origin, but here observers and statisticians are at variance, and until they have come to a common agreement concerning these fundamental facts the issue must remain uncertain.

Whatever may turn out to be the correct view, Professor Koch has done us the service of directing attention to what is indisputably the principal cause of tuberculosis—the primary cause as distinct from the predisposing causes, whose name is legion. We refer to the dissemination of the tubercle bacillus by the prevalent and disgusting practice of promiscuous expectoration. Every consumptive person is a focus of infection so long as he or she recklessly spreads broadcast the living germs of the disease, many millions of which are contained in each expectoration. If we can persuade or constrain consumptives to dispose of their secretions in such a way as to prevent their contaminating their yet healthy fellows one great source of infection will have been done away with. It is by education and persuasion that we must hope to bring about this "consummation devoutly to be wished." Repressive legislation would be difficult to obtain and quasi-impossible to enforce. Not that coercive measures might not be adopted to some extent. It seems feasible to prohibit, under a penalty, persons from spitting in public vehicles, omnibuses, trains, and the like, just as smoking is prohibited, or other deed "calculated to cause discomfort to the other travellers." No new law would be required for that. In the meantime municipalities and our great companies should everywhere place conspicuous notices calling attention to the disgusting and dangerous nature of the habit.

Over and above the question of how the infection is conveyed there remains the vastly more important question of the circumstances and conditions which predispose to the disease. A proneness to the disease may be inherited or acquired. Even when inherited the liability may be averted in great measure by care and intelligent observation of the laws of health, or it may be intensified by following an unhealthy occupation, by alcoholism, by breathing impure air, &c.; in fact, by habitual neglect of the laws of health which, if persisted in, will create a predisposition even in the healthiest. The problem of housing the labouring classes in well-aërated dwellings, free from overcrowding, is one which is so vast as to excite a feeling of discouragement. Much, however, has been done, and is being done, in this direction, and one result of these periodical Congresses will be to educate the public to a sense of the overwhelming importance of dealing with this question.

With regard to curative measures the general opinion was unequivocally in favour of the provision of additional sanatoria for consumptives. Under favourable circumstances phthisis is distinctly a curable disease, and in most instances these conditions can only be realised in institutions of this character. Moreover, this system enables us to remove the sufferer from his unhealthy environment, where he is a source of danger to his family and to his neighbours, with every prospect of rendering him *de novo* a useful member of society. There were several papers on the climatic treatment of consumption, but as this treatment is only available for persons of ample means it is hardly worth discussing at a Congress which aims at attacking the disease at its source.

With regard to tuberculin—that is to say, the treatment by inoculation—it is noteworthy that the least enthusiastic advocate thereof was Koch himself. Dr. Heron read a paper in which he said he had obtained encouraging results by this method of treatment, but his advocacy hardly found an echo.

Dr. Harold Coates (of Manchester) read an interesting communication giving the result of his investigations into the value of voluntary notification of phthisis which enabled him to carry out certain researches into the prevalence of the tubercle bacillus in various classes of dwellings and public buildings. In 66 per cent. of infected houses described as "dirty," the dust contained the bacillus, and even in clean houses 50 per cent. yielded the bacillus when the phthisical occupant used his handkerchief or the floor as the receptacle for his expectoration. In contrast, five specimens of dust from the out-patient department of the Manchester Hospital for Consumption all gave negative results. Two samples from the general waiting-room of a railway-station, on the other hand, both gave positive results. These facts emphasise the necessity of systematic cleanliness and thorough disinfection of dwellings which have been, or are actually, occupied by persons suffering from consumption. It is by facilitating these measures that notification is calculated to render service. Unless, however, it is to be the prelude for subsequent precautions, it is useless.

Professor Brouardel (of Paris) struck an individual note when he declared that one of the great causes of the prevalence of phthisis is alcoholism. No one questions the fact that, by debilitating the organism and reducing the standard of health, the abuse of alcoholic drinks may indirectly predispose to consumption; but it is not a specific cause, and the mortality from consumption stands in no discoverable relationship to the prevalence of alcoholism.

Some interesting facts were brought forward in regard to the possibility of diagnosing pulmonary tuberculosis in its early stages by the aid of the *x*-rays, but this is a matter of too technical an interest for us to dwell upon.

Whether the Congress has "come up to our expectoration," as a German gentleman expressed it, we must leave it to the future to decide. It will be memorable as having been the means of calling attention to the immensely greater importance of man-to-man infection as compared with infection from animals and by articles of food. The interest shown in the proceedings by the general public, apart from those interested therein for commercial and professional reasons, shows that progress is being made in the education of the public, which is the object and aim of such Congresses.

The resolutions passed by the Congress erred on the side of verbosity, but they will meet with public approval as far as they go. The Congress formally condemned promiscuous spitting; urged additional accommodation in the matter of sanatoria; enjoined medical officers of health not to relax their efforts to keep contaminated articles of food out of the market; and advised the creation of a permanent international committee with the mission to collect and compile all information bearing on the question of the prevention and cure of consumption.

It would be unfair to conclude the notice without a word of praise for the members of the organising committee, to whose energy and intelligent organisation is due the admirable way in which the Congress went off.

There was no ground for complaint on the social side. The foreign delegates were received by his Majesty the King, who said nice things and called their attention to the fact that in cancer we have another disease which has so far baffled the ingenuity of men of science. They were entertained at dinner on Friday, and on the other days a generous hospitality was dispensed in various directions, though the weather more than once frowned on the efforts of the noble amphictyons.

South African News.

(From our Colonial Correspondents.)

Business Changes.—Mr. John W. Couldridge, who has for the past seven years acted as manager of the North End branch of Messrs. J. A. Willet & Co, Port Elizabeth, is opening a pharmacy at 113 Princes Street, Port Elizabeth, which he expects to have ready at the end of August. Mr. Couldridge is succeeded by Mr. Jackson, manager of Messrs. Willet's Western Road branch, and Mr. Cheyne, late assistant to Mr. Kirby James, Market Square, succeeds to the management of the Western Road shop.

Want Consul to Stay.—American Consul Stowe, of Cape Town, who has done splendid work in introducing American goods into South Africa, has tendered his resignation, his reason being that he could not live at Cape Town on $3,000. Some American manufacturers have appealed to the President not to accept the resignation, and have offered to contribute $4,000 a year to compensate him for his services. The President has had to decline the offer, as consular agents cannot under the law receive compensation from private parties. Congress may take action.

Plague in Port Elizabeth.—A correspondent writes on July 6 that the chemists in Port Elizabeth are doing a good trade in disinfectants in view of the outbreak of plague here. So far there have been eight cases, of which five were Europeans. Two have since died. The first symptoms seem to simulate influenza (which is also rife here just now), a short cough, slight fever, headache, and pains. The cause of infection is supposed to be fleas from rats that have died of plague, the infected rats having been brought here from foreign ports in hay, &c, landed by the military. Of course the authorities have commenced a crusade against rats, offering 3*d.* each for them, delivered at the Town Office, and rat-poisoning is going on throughout the town, the chemists again scoring.

Westminster Wisdom.

Cancer Investigation.

Mr. Weir asked the First Lord of the Treasury on July 29 whether, in view of the increase of cancer, he would consider the advisability of the appointment of a Commission or committee to inquire what steps could be taken for aiding research into the cause, cure, and prevention of this disease. Mr. Balfour replied that he could not believe a Commission would be the proper machinery for carrying out delicate and difficult questions of medical research. The prevalence and increase of cancer is occupying every medical mind over the whole of the civilised world, and he did not think the appointment of a Commission would either aid or stimulate inquiry.

The Factory Acts.

The Grand Committee on Trade met on July 29. The business consisted in consolidating the Factory and Workshop Acts Amendment Bill and the Factory and Workshops Acts Consolidation Bill into one Bill, and in passing the clauses of the Consolidation Bill as amended by the Amendment Bill. The measure is expected to come before the House for the report stage in the course of next week.

Commercial Agents.

Viscount Cranborne, in reply to a question in the House of Commons on July 29, gave the following particulars of the duties of British commercial agents: The British commercial agent in the United States has his headquarters at Chicago; his general duties consist in watching and reporting on the commerce, industries, and products of special districts, and in answering inquiries from chambers of commerce and firms. His salary is 500*l.* a year, and he also receives an allowance of 300*l.* to cover travelling and other expenses. His salary and allowance, as well as those of the other commercial agents, are accounted for under the Diplomatic and Consular Vote, subhead "Special missions," partly under the heading "Collation of commercial intelligence," 2,000*l.*, and the balance (200*l.*) out of "Unforseen missions." The commercial agents for Russia and Switzerland reside at Moscow and Zurich, and receive respectively salaries of 500*l.* and 300*l.* and allowances of 300*l.* and 200*l.* a year. The remaining commercial agent, who acts for Central America, and who is permitted to trade, receives only an allowance of 100*l.* All these appointments are experimental.

New German Tariff.

Mr. Gerald Balfour said in the House of Commons on July 30 that translations of the principal sections of the proposed German tariff will be published in the weekly *Board of Trade Journal.* A meeting of the advisory committee on commercial intelligence has also been summoned to consider the matter, and a comparative statement of the existing and proposed duties chiefly affecting British traders is being prepared by the Board of Trade for the information of this committee and for presentation to Parliament. It will apparently be some time before the section of the tariff referring to drugs is published in the official journal, as this week's issue only contains the portions referring to cotton and woollen yarns.

The Congress Resolution.

The British Congress on Tuberculosis passed a resolution urging on the Government the desirability of instituting an inquiry as to the inter-communicability of bovine and human tuberculosis. The matter is receiving the attention of the Government, said Mr. Long on July 30, but at present no decision has been arrived at.

Canada and Germany.

There has been much agitation caused in Canada owing to the continued tariff discrimination of Canadian goods entering Germany. The Secretary of State for the Colonies was asked on July 30 if any negotiations were being carried on with Germany to secure for Canada the advantages of a most-favoured-nation clause in a commercial treaty. The reply was that the important questions raised are receiving the serious consideration of the Government.

British Medical Association.

THERE is a singular appropriateness in the motto "Salubritas et Eruditio" which adorns the arms of the town of Cheltenham, where the sixty-ninth annual meeting of the British Medical Association is being held this week under the most favourable climatic conditions. The proceedings began on Monday evening with a brilliant reception in the Winter Garden, at which all the learning and beauty connected with the medical profession in Cheltenham and elsewhere congregated to renew friendships, to listen to the music, and incidentally to inspect the various exhibits in the

Museum and Exhibition.

It is with this particular department of the Association's affairs that we have more generally to deal, and the Exhibition, as regards the number of exhibitors and the quality of the exhibits, is particularly successful. The Winter Garden at Cheltenham is an ideal building for such an exhibition, and 112 exhibits are to be seen. We have endeavoured to classify the various exhibits under suitable headings, but some of the firms exhibit in more than one of the classified sections. The first, and perhaps the most important in point of interest, is the

Pharmaceutical and Chemical

exhibit, in which sixteen well-known pharmaceutical firms take part. Amongst these Ferris & Co., of Bristol, have two large corner shows which are creating, by reason of their diversity, continual interest. The well-known specialities of this firm are present in force, and various novelties, such as the new "Bristol" dispensing-cabinet, are introduced for the first time. This is a compact cabinet forming a complete and useful equipment for a small surgery, branch practice, or cottage hospital. The cabinet contains 157 stoppered flint bottles and jars which are well and boldly labelled. It is about 7½ feet high, the width about 4½ feet, and the depth at the base from back to front is 1 foot 5 inches. It is divided into three sections, the upper portion, closed with two doors, contains the greater part of the bottles and jars. The doors are fitted with shelves, a sliding-frame keeping the bottles in place. The middle portion is fitted with a water-tap with a fine nozzle, and a sink with a shelf for draining bottles. There are drawers for labels and paper below, and the lower portion is closed with a panelled flap, which is hinged at the lower side, and when open forms a dispensing-counter. The cabinet and fittings are self-contained, and there are no attachments to be made to water-service pipes or drains. This well-made and convenient cabinet may be supplied in walnut, oak, mahogany, or other hard wood, and when closed it looks very handsome. Amongst other novelties are "Otoids"—small gelatin cones, containing a variety of ingredients for aural medication. Surgical bandages, surgical instruments, and a large number of Ferris & Co.'s specialities are displayed at these stands. The style of fitting is attractive, and attention is particularly drawn at each stall to the fact that another stall by the same firm is situated in the opposite corner. A small show is made of the Von Heyden pharmaceutical products. Frank A. Rogers is showing a complete set of his medical sprays and atomisers, besides "Thermogen," an apparatus for heating spray-solutions—aquol, benzoin-aquol, and a series of hypodermules. A neat and attractive little show is made by E. Merck of many fine and rare chemicals; and Thomas Brothers, chemists, of Bath, have a large exhibit principally devoted to photographic sundries and pharmaceutical specialities, such as those of Thomas Christy & Co. and Jeancard, Gazan & Doumin; Ross's field-glasses, and the thermometers and instruments manufactured by J. J. Hicks, as well as Kelene and Kelene-masks for its administration, as supplied by R. W. Greiff & Co. Bromaurum and hydrarum, for the treatment of cerebral and spinal degenerations, are being shown by Arthur & Co., who also exhibit various proprietary articles, antiseptic handkerchiefs for the phthisis patient, tongue-cloths made of rice-paper, and various other things. Zimmer & Co. show tablets of euquinine, eunatrol, validol, and other preparations, including fortione and eupyrine. Southall Brothers & Barclay (Limited) have two stalls: one entirely devoted to surgical dressings, the other to pharmaceutical preparations. The firm's own manufacture of cotton-wool and gamgee and celtex tissues are shown. The latter is a substitute for gamgee, being a mixture of wood-cellulose and cotton-cellulose, and considerable interest is attached to the exhibit by the fact that the raw specimens are shown illustrative of the manufacture of flax, lint, cotton-lint, and celtex tissue. Messrs. Southall claim that they are the sole manufacturers of lint from flax in this country, and that they are the only manufacturing chemists who card, weave, bleach, and lint surgical dressings. The "Azoic" dressings are sterilised by superheated steam in the cartons in which they are packed. Sanchiefs (antiseptic handkerchiefs) are for phthisis patients, while a speciality is made of Taylor's moist gauze. In the pharmaceutical exhibit standardised tinctures are given large place, and there are also shown solid extracts of belladonna, henbane, &c., made from the new crop. Besides the ordinary standardised tinctures, the firm make various 1 to 3 concentrated tinctures. In this section also various kinds of scientific apparatus are shown, amongst them the water-analysis apparatus invented by Dr. Barwise, and a food and drug demonstration cabinet. The Bayer Company are showing their various pharmaceutical products, and C. J. Hewlett & Son their proprietary preparations. Messrs. Hewlett are also showing new drugs, such as the fluid extract and tincture of monsonia, isphagul, sidonal, and the cacodylates. Parke, Davis & Co. have secured a very prominent position at the top end of the building. They have three stands tastefully decorated with palms and flowering medicinal plants, such as henbane and digitalis. Special importance is given to the new sero-therapeutic remedies. In order to demonstrate the way in which the serums are sent out, three enormous hermetically-sealed glass bulbs, each capable of holding about 3 gals. of serum, are shown in the centre stall. This forms a striking object-lesson, and, being boldly labelled, visitors are not likely to forget its appearance or where it is obtained. Adrenalin is given considerable prominence, and the latest pharmaceutical preparation, creosoted cod-liver-oil emulsion (containing 1 per cent. of creosote), is pleasant to the taste and agreeable to the eye. Lactated pepsine, as the official U.S.P. preparation, is also being well pushed, and the suprarenal gland and thyroid-gland extracts are now being supplied in gelatin capsules as well as in the compressed form. A good show is made by Wyleys (Limited), of Coventry. Tropels predominate, but liquid extracts, pellets, proprietary preparations, fluid extracts, and standardised tinctures, are also to be seen. Cheltenham salts and Bath salts have been appropriately added to the list of effervescent tropels. The products of Fairchild Brothers & Foster are given special prominence in a neat and attractive stall, but we observed nothing that has not already been noted. Corbyn, Stacey & Co. have a nice show of drugs, chemicals, and pharmaceutical preparations. Fluid extracts are made a speciality and various unusual galenicals. The palatinoids of Oppenheimer, Son & Co. (Limited) are also given a good show, and the new aërisers and vaporisers are specially pushed. The "Compactum" hypodermic case, which we described a few weeks ago, is going strong, and the firm also show a large number of medicine-cases of various kinds.

Alimentary.

The Foodstuffs Section is strong as usual, some two dozen firms exhibiting, prominent among them being the stands of Bovril (Limited), Virol (Limited), Liebig's Extract of Meat Company (Limited), each with their well-known preparations nicely displayed. Brand & Co. (Limited) draw special attention to their nutrient-powder, fever-food, and meat-juice (in flat bottles) The Myosin Albumin Meat-extract Company are showing Mamesin (a preparation of myosin-albumin extracted from beef) and Ma. me. co.—the same with the "extractives," "waste," or "gouty" products removed. Peter Möller had an attractive little exhibit of his hydroxyl-free cod-liver oil, in which the doctors still appear to be interested; while malt preparations are being shown by the Maltine Manufacturing Company (Limited) (maltine with cascara is their strong point) and Hans Hoff. In conjunction with the Maltine Company, Carnrick's peptonoids are exhibited; and Mr. Blau (Hoff's malt) has Ironol under his wing. Scott's emulsion has a special stall to itself; and the "grateful and comforting" beverage is being dispensed at Cadbury's stand. Cerebos (Limited) make a good display of their celebrated salt, and Keen, Robinson & Co. (Limited) of their equally renowned barley and groats. Nestlé's milks and foods are not allowed to be forgotten, and Mellin's Food (Limited) have a large show of their preparations. The number of anti-diabetic and anti-dyspeptic foods on show are many, and they seem ever increasing. The most striking show is that made by Cheltine Foods (Limited). The firm have secured a prominent corner, where their foods (five different kinds) and biscuits are well displayed. Prideaux's Pure Casein and Life Food Company (Limited) have made, they say, "a complete revolution in food." Their preparation "Casumen" is put forward as a perfectly soluble (its solubility was demonstrated) proteid made from fresh sterilised Dorset milk; Messrs. Nathaniel Smith & Co., chemists, Cheltenham, are agents. Many varieties of diabetic foods are shown by Callard & Co., who have also anti-obese foods and celery and spinach biscuits for gout and rheumatism. The Manhu diabetic foods are another variety, and the preparations of G van Abbott & Sons for similar purposes are legion. The Plasmon luncheon-outfits (containing ten Plasmon biscuits and three bars of chocolate for 6*d.*) bring many callers to the stand of International Plasmon (Limited), where Plasmon cocoa (60 per cent. plasmon) is amongst the attractions. Other strengthening foods are supplied by the British Somatose Company (Limited) and the Protene Company (Limited). The stall of the latter company is in the hands of a capable lady demonstrator, who succeeds in interesting all the visitors who come near her stall with the merits of Protene. We can certainly vouch for the palatibility of the Protene preparations, and the gold medals obtained at various international exhibitions appear to show that this milk-proteid product has some value.

LUBRICANTS.

The thirst-compelling climatic conditions prevailing at Cheltenham this week focussed the interest in drinks more strongly than might otherwise have been. There were many exponents. Schweppes (Limited), under the superintendence of Mr. A. C. Saxby, chemist—the local agent—are showing a new syphon, which is porcelain-lined throughout, even to the inside of the nozzle. Their waters are also put up now in egg-shaped bottles, but with a flat bottom to stand the bottle upright. Distilled waters, bottled, and Malvern waters, plain and aërated, are also shown. The Harrogate Corporation, the borough of Leamington, and the Corporation of Cheltenham have each exhibits of their waters, while an excellent model of part of the Roman Thermæ at Bath is situated near the main entrance. Ingram & Royle (Limited) have the Vichy and Carlsbad waters, salts, and pastilles, "Pulverformig" Sprudel salt, and Hunyadi János; and the Apollinaris Company show Apenta, Apollinaris, Johannis, and Fredrichshall. The Abbey Effervescent Salt Company (Limited) have a small exhibit of their saline by the top of the hall. Stephen Smith & Co. (Limited) have their usual Hall's wine and Keystone specialities, the Keystone Burgundy being a favourite tasting-beverage with exhibitors. A Riddle & Co. make one of the top corners very pretty with their background and trimmings for the display of Stower's lime-juice cordial. Lime-juice cordial and lemon-squash are to be seen (and tasted) at Feltoe & Smith's stall, and Glendenning's meat-and-malt wine and other preparations are there.

HYGIENIC.

The specialities of the Sanitas Company (Limited), Jeyes' Sanitary Compounds Company (Limited), the Sanitary Woodwool Company (Limited), Paté, Burke & Co, the Liverpool Lint Company, and the Izal preparations were each being vigorously brought to notice at their respective stalls.

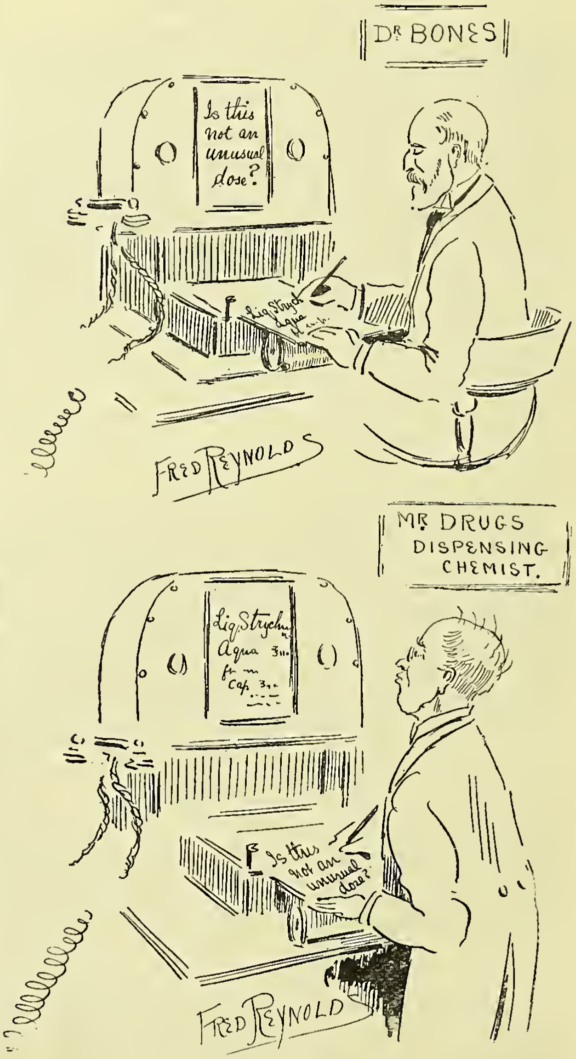
INSTRUMENTS AND APPLIANCES.

As may be imagined there are some very fine shows of surgical instruments. One of the principal exhibitors in this section is Allen & Hanburys (Limited), showing, amongst many other wonderful things, a new patent Clover's ether-inhaler with a glass dome to the ether-chamber. A neat inhaler for administering kelene is also exhibited, and a multitudinous assortment of surgical instruments, sprays, and electric lamps. Down Brothers have three separate exhibits near the main entrance. Mayer & Metzler have a room at the top end of the hall entirely devoted to their goods. The principal novelties appear to be in improvements upon operating-tables and things of that description. Similar exhibits are made by John Weiss & Son (Limited) and Salt & Son, of Birmingham. H. W. Cox (Limited) are showing *x*-ray apparatus, including Cox's portable field-service outfit, as supplied to the Admiralty and War Office; the new mercury brake, suggested by Mr. MacKenzie Davidson; and apparatus for wireless telegraphy.

SUNDRIES

Floor polishes and stains are shown by Ronuk (Limited). The Ronuk polish is being taken up by many public institutions throughout the country, and their representative is especially proud of the fact that the floor of the National Gallery is polished with Ronuk. A. H. Hamilton & Co. are showing the "Shell" brand floor-polish for which a high polish, hygienic and aromatic properties are claimed. Medical books are shown by Macmillan & Co., W. B. Saunders & Co., John Wright & Co., and H. Kempton.

The Art of Pharmacy.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Is this not an unusual dose?
Liq Strych Aqua
FRED REYNOLDS
Mr DRUGS DISPENSING CHEMIST.
Liq. Strych. Aqua
Is this not an unusual dose?
FRED REYNOLDS

The Telautograph has inspired Mr. Fred Reynolds. His pharmaceutic mind is keen to catch the value of this ingenious invention as an intermediary between pharmacist and physician, and he expresses his ideas in his characteristic way.

Observations and Reflections.

By XRAYSER.

The Summer Number suggests comments which might fill another like it. The most obvious reflection is the one which is the least original. It is that these special numbers of the *C. & D.* prove (and doubtless stimulate) not only the variety of interests which make up modern pharmacy, but also the increasing prosperity of the drug-trade. They follow each other (alas! how rapidly time slips on) at such apparently short intervals, and yet the wholesale people evidently find it pays to spend more and more in them on every recurring opportunity. The total cost of the insets alone issued as supplements to the last Summer Number would reach several thousands of pounds. This and a great deal more has to be got back out of orders from retail chemists and druggists; that is, out of the profits on those orders.

Corroborative Evidence of the development of pharmacy from a poor profession, such as it was when the apothecaries mainly ran it a century ago, into an important business such as it is coming to be, is afforded by a few statistics which I have picked up in my study of this issue. Messrs. Maw, I observe from their inset (page 6), have increased their staff more than eight-fold since 1859. On page 112 I read of "a dense crowd of employés [of Messrs. Evans, Sons & Co., of Liverpool], numbering about 600"; and on page 123 the statement appears that "the [tabloid] firm had now more than a thousand employés on the permanent roll" These, be it remembered, are only specimens of successful businesses, though conspicuous ones. Probably there have been firms supplying chemists and druggists who have dropped out of the running, though I do not remember any very notable example, during the past half-century. A few old houses have amalgamated with newer ones, and perhaps the staffs of some few have decreased by half-a-dozen hands or so. But look at the multitude of new manufacturers and wholesalers who have sprung up, the many great firms in semi-foreign lines which have courted pharmacists, as well as at the astonishing development which dozens of our famous houses can point to, and I think the conclusion that I have arrived at, that the retail drug-trade is somewhere about ten times as big a thing as it was in the middle of the last century, is not an altogether wild estimate.

Ready-made Medicines are, perhaps, the most prominent feature of the advertisements in the Summer Number. Several of the insets are exclusively devoted to these. Ready-made pills, ready-put-up proprietaries of every kind, from soaps to lemon-squash; your own lavender-water, your own tooth-paste, your own cod-liver oil if you like, extracted at your own fisheries in Lofoten, I suppose, everything can be supplied to you in a finished state fit to pass from you to your customer. This is modern pharmacy. I am not surprised that many old-fashioned and sentimental chemists and druggists regret, and that some even resent, this modern development. You cannot feel the same affection for a medicine, a perfume, or a food made up by machinery in one of these London factories, as you did for those which you devised, clothed in suitable packages, labelled after much thought and anxiety, and in which you came to entertain a reverent faith. But it is of no use to fret about it. The machine has beaten you. You cannot make pills or put up proprietaries as stylishly as these people do it for you nor, if you take a proper account of your time, can you do it anything like as economically. All the same, I think it is wise for the chemist to have at least one or two specialities of his very own.

Mr. J. W. Swan, F.R.S., is worthy of all the glory the Society of Chemical Industry and the *C. & D.* have given him. I am disposed to think that Mr. Swan is about the most famous pharmacist this country has produced. When we come to think it over, British pharmacy cannot be credited with many names of world-wide reputation. On the façade of the School of Pharmacy at Paris there are thirty-six medallions of famous pharmacists. Of these the only English representatives are Sir Humphry Davy and Sir Isaac Newton. Davy was certainly apprenticed to an apothecary, and we have some right to claim him. Newton would be a glorious find, but his association with our craft is a little too thin. "When he was 12 years of age he was sent to a school at Grantham and lodged with an apothecary named Clarke" That is the explanation of his right to a medallion given in a French treatise describing the school and its architecture. Mr. Swan was for many years a genuine pharmacist and a noted one, and his great electrical work has been, as is distinctly shown in the article, a direct outcome of his work in that capacity.

Habitat.

Dr. Murray's postcard to Mr. Druce is, as it is stated to be in the article, "an excellent example of the trouble that is taken in compiling a dictionary," and it is also of interest as regards the subject itself. We are not told how Mr. Druce replied to Dr. Murray's query, but I doubt if many ordinary readers could be certain without referring whether the "habitat" of a plant was its geographical range or the kind of locality in which it is usually at home. I was curious to see what conclusion Dr. Murray came to, so I referred to his dictionary, and found the definition given as follows:—

> The locality in which a plant or animal grows or lives. Sometimes applied to the geographical area over which it extends, or the special locality to which it is confined; sometimes restricted to the particular station or spot in which a specimen is found; but chiefly used to indicate the *kind* of locality, as the sea-shore, rocky cliffs, chalk-hills, or the like.

Other leading dictionaries, such as the "Century," "Webster," and the "Standard," are more or less confident in explaining the word as meaning geographical range particularly, but Johnson is very definite the other way. "As fen, marsh, mount, and the like," he says. The botanical works at my hand, which include Hooker and Bentley, scarcely use the word. For geographical range the authors named invariably adopt the term "distribution."

"Three Score," who comments on the 1870 action in reference to the dispensing of poisons, correctly states that it was held on that occasion by Mr. Justice Lush that the words in Section 17 of the 1868 Act, requiring that a medicine dispensed containing poison must be labelled "in the manner aforesaid," meant simply "distinctly and legibly." But that part of the judgment was of little importance, because the counsel for the police, who maintained that the lotion made of prussic acid and rose water should have been labelled poison, abandoned the point from the beginning, saying he wanted a decision on the Act then in force, not on a dead section. "Three Score" is also accurate in saying that the Act of 1869 received the Royal assent on the very day when the medicine referred to was dispensed, and the chemist's counsel claimed that his client was protected by that Act, which he insisted was in force all that day. The counsel for the police said he had no desire to dispute that assumption. I should hardly think, however, an Act can come into force at any time before the moment when the Royal assent is given.

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Editorial Comments.

Dublin.

It is such a charming city that we have no right to express surprise at the success of the meeting of the British Pharmaceutical Conference there this week. Sufficient of attraction and interest was in the programme undoubtedly to draw a representative gathering, but the most optimistic conferee never expected either so full a meeting or so good an one Last year the exchequer of the Conference was in a flabby state; this year both sides of the accounts square without any juggling. The membership is not actually any better, but it is no worse; still, when the Conference last met in Dublin it had 2,000 members, and now just about half that. Then the meeting was attended by 150 persons, this week, before the *conversazione* was held in the Science and Art Museum of Dublin, the Local Secretary had issued tickets for 400 visitors and local pharmacists. These facts amply confirm what we said last week, when writing of the President (Mr. Druce)—viz., that the genuine interest in the Conference and its work, as manifested by attendance and personal interest, is greater now than ever it has been, and, although it would be unwise to claim that this is wholly due to the scientific and practical part of the Conference programme, there is no gainsaying the fact that the organisation fills a gap in pharmaceutical life that nothing else does or can do.

The President in his Address rightly said that the Conference has no politics, and that "every pharmacist in the Empire may join its roll without compromising any opinion or subscribing to any creed." That is a unique thing to say in respect to a British pharmaceutical body. What immediately followed in the address (to which we would now particularly refer) revealed, indirectly, the immense possibilities of the British Pharmaceutical Conference, if it were a rich body with a paid staff of officers to force its claims upon the pharmacists of the British Empire, with active members and what we may call the rank and file. It must be said here, in no uncertain manner, that within the Conference there is no thought whatever of merging its interests with those of the Pharmaceutical Society of Great Britain. This we already stated, and again we emphasise it after fresh compact. The keynote of Mr. Druce's address was struck for him by this meeting being the first in a new century, and the need there was for the Conference to look back upon the achievements of the nineteenth. First, he charmed his audience, some of them from distant climes, with his graphic references to the expansion of the realms of the British crown during the period; then he dealt with the progress of science during the century. The working pharmacist was at once seen in this, for he began with photography—now an important part, as it has always been, of the pharmacist's business—and proceeded to deal in turn with chemistry, biology, and botany. It was expected that Mr. Druce would tell the Conference something about botanical progress, but he left out no science that is allied to pharmacy, or is likely to be through the advance in medical knowledge, so that his address will make a fitting record of nineteenth century scientific progress to include in the annals of the Conference. Nevertheless, to many in the Royal Society's lecture-theatre the last part of Mr. Druce's address gave greater pleasure, because in it he dealt with trade questions—(1) Is there a decadence in pharmacy? (2) If so, what are the contributing causes? (3) Is there a remedy? Mr. Druce gave a Scotch answer to the first of these questions, which is not a satisfactory answer at all, and any answer must depend upon what is meant by decadence. Pharmacy is essentially a two-sided occupation; one side is commercial the other scientific. When the Conference was a baby both were beautifully blended, so as to appear in many instances a perfect composite—Mr. Druce admirably expresses it as "symbolic union." There has since been differentiation; the commercial element has become, like all trades during the past quarter of a century, so specialised that the old, easy-going ways of doing business are no longer profitable. The introduction of the store system of trading is not alone responsible for this, at all events in the initial stage; but since, through the flaw in the Pharmacy Act, the drug-trade has been exploited by capitalists as a means of making dividends, the differentiation has proceeded at a tremendous pace. This necessarily has carried with it decadence in the personal factor, which was the honourable tradition of pharmacy as a calling, and which is now reserved to the cultured few. On the scientific side there has been no decadence, but the opposite in the sense that pharmaceutical processes have been improved along with pharmaceutical education and qualification, but the improvement (as, for example, in the standardisations of galenicals) is so great that it is impossible for the majority of retail pharmacists to "make everything" as they were wont to, and look after their business as a business at the same time. Even the best of our retail pharmacists who endeavour to keep up the old customs have to delegate this higher work to specialists in their employment, while the smaller men, who cannot afford this luxury, get the benefit of specialists employed by their wholesalers. This is an economic convenience which we may deplore, but it is no more decadence than any other phase in evolution. We regret that plans have not worked out exactly as we anticipated, but that is the nature of plans which ignore the controlling influence of environment, which in this case is a symbiotic union of the Great British Public and the authoritative British Pharmacopœia. Mr. Druce's reply to the third question was not very definite, but he believes that something can be done by legislation, and that, we surmise will be to get the Legislature to ensure that each man who performs the functions covered by the Pharmacy Act shall be a person qualified under the Act. There is much else in the address that deserves consideration, but the purpose of this note is merely to call attention to the more striking points in it. We must now turn attention to the papers which were up to the average in number and quality. We deal with them in the order in which they were read, and give the briefest references to the discussions.

Jalap. In regard to the resinous strength that of jalap goes as high as the 20's in percentage. Dr. Attfield, summing up the opinions of more recent observers thirteen years ago, reported that the quantity of resin had been diminished. Mr. John C. Umney now gives point to this observation in his paper on the "Pharmacopœial Requirements for Jalap," wherein he shows that, out of thirteen specimens examined, only two went into double figures of resin-percentage. The highest was 18·4 and the lowest 5·4, the average being 8·3 per cent. The decreased value, Mr. Umney suggests, is due to carelessness in collection, and probably in cultivation. Incidentally he shows that, as the jalap answering the official requirement cannot be obtained, it is necessary to standardise the tincture without regard to the extractive content. Hence the latter is bound to be a very valuable quality. Mr. Umney's observations were corroborated by Mr. Ransom from data accumulated by himself recently, although he finds an average of 10 per cent., with 8 per cent. as the lowest. There was general agreement that the Pharmacopœia standard should not be lowered, but that some effort should be made to get Mexican collectors to be more careful in collecting mature drug, which may be encouraged by giving them a better price for it.

Estimation of Hydrogen-peroxide. In the estimation of hydrogen-peroxide solution by the permanganate method as adopted by the British Pharmacopœia (in which oxygen to the extent of double the available amount is given off), there is always some discrepancy, and this Messrs. Naylor and Dyer in a paper explain to be due, apart from physical influences, to reaction between sodium chloride and sulphuric acid with permanganate-solution, whereby chlorine is evolved. As the use of mercury in the place of brine is out of the question, owing to its expense, the authors suggest a saturated solution of magnesium sulphate, which does as well as brine, and gives no error. They also commend to attention the method suggested many years ago by the late Mr. A. H. Mason, in which the volume of oxygen liberated by excess of potassium bichromate is measured, 10 c.c. of gas being obtained from 1 c.c. of a ten-volume solution. Kingzett's method was also favourably referred to. Mr. Bird and Mr. Tyrer, speaking from commercial experience, agreed with Mr. Naylor; and Mr. Bird mentioned that he has used ammonium-sulphate solution with success in place of brine.

Cascara Sagrada.

Miss Bridget Rose Clinton has the distinction of being, as far as we can recollect, the first lady to communicate a paper to the Conference. The subject that she selected was cascara sagrada, and her brightly-written paper contained cogent observations upon the enormous consumption of this drug to stimulate the sluggish intestinal apparatus of the citizens of the world. The experiments described in the paper were intended to produce a better preparation than the British Pharmacopœia's aromatic syrup of cascara, and a number of formulæ were given, concluding with one which is substantially a modification of the ingredients which Messrs. Parke, Davis & Co. stated many years ago to be the basis of their cascara cordial. The Conference displayed much interest in Miss Clinton's appearance, as well as in her effort to enlighten them upon how to make this bitter drug palatable. The paper also served to bring from Dr. Attfield a justification of the use of the masculine in the specific name of *Rhamnus Purshianus*, which was that De Candolle was first to call it that, and it is the rule to follow the name of the first discoverer, whether right or wrong. We noted that Miss Clinton spoke of *R. frangula* in her paper, but we print *R. catharticus*, to which she obviously referred.

Robinia Pseud-acacia, Linné.

Two lengthy papers on the bark of this tree, better known as the false acacia or common locust, were communicated. The first, by Dr. Power, recalled the fact that in 1899 he isolated from the bark a poisonous proteid, which he called a phyt. albumose. This proteid resembles abrin of jequirity seeds, ricin of castor-oil seeds, crotin of croton-seeds, in toxicity and action, and it is the only principle of the kind found in a bark. Dr. Power has returned to the subject, partly in consequence of recent publications on the Continent, and he has made a fuller examination of the bark. In the paper he described very fully the character of the proteid, and showed that there is in robinia a ferment (if not the principle itself) which is capable of splitting up amygdalin and potassium myronate. He has besides obtained evidence of the presence of a glucoside syringin, syringic acid, one or more alkaloids, besides tannin and a sugar. The second paper was on the anatomy of the bark, and was an exhaustive description of a careful microscopic examination by Mr. P. E. F. Perrédès, B.Sc., F.L.S., pharmaceutical chemist, which we cannot usefully abstract, but we print the excellent drawings prepared by the author, of which lantern-pictures were shown to the Conference. Nothing but compliments followed the papers, which Dr. Power gave the gist of in a quarter of an hour.

Standardisation.

This was rather a clever title of a clever paper communicated by Mr. N. H. Martin, of Newcastle-on-Tyne. We commented about two months ago on some observations by E. Merck regarding the standardisation processes of the German Pharmacopœia. Mr. Martin takes up the same subject, and he expressed the opinion very straightly that chemical standardisation in respect to galenical preparations whose therapeutical value has been proved by generations of experience is carrying things too far. By all means, said he in effect, let us see that the drugs actually employed are of minimum degree of potency, but if we are to standardise upon the basis of definite chemical substances existing in the drug it will be a better plan to include preparations of these substances in the Pharmacopœia alongside the old established galenicals. Experience with the one or the other will in time determine which is the better therapeutical.

Mr. H. Wippell Gadd submitted a series of notes on this subject in which practical difficulties were described. For example, he has been unable to obtain in the market nux vomica sufficiently strong in strychnine to afford a liquid extract by using the Pharmacopœia quantity of the drug. Speaking of cinchona-bark he described the peculiar results which followed from storing the drug over a mill room where the vibration was such that excessive portions of the drug taken from the room yielded preparations of totally different strength. This is another illustration of the observation made by Mr. R. H. Parker at the Liverpool Conference that in grinding and sifting belladonna one has to be exceedingly careful to mix the bulk after sifting, because there is so much starch in it that the starchy portion is apt to be collected in the first instance. Mr. Gadd submitted records of cinchona assays, and made some observations regarding the standardisation of tinctures of benzoin, myrrh, and rhubarb, liquid extract of cascara sagrada, and gave a useful comparison of the extractive yield of concentrated liquors and fusions, concluding with an interesting comparison of compound liquorice-powder prepared by mixing the powders and the kind made by grinding all the solids together. Extract of malt was also referred to.

These papers practically finished Tuesday's proceedings, for after Mr. Maben, Dr. Griffiths, Mr. Bird, Mr. Cowley, and Dr. McWalter had spoken, Dr. Attfield moved the adjournment of the debate, which was getting warm, and highly controversial. So far only seven of the dozen papers on the first day's programme had been disposed of, and the weather was so good that the attendance had shrunk to two score serious males.

Wednesday morning's proceedings commenced with a paper on

Estimation of Phenol.

Dr. John C. Thresh, a former Secretary of the Conference, communicated a note on the estimation of phenol in carbolised gauze. Having found that the accepted methods gave varying results he devised one in which a weighed amount of gauze is placed in a flask with hydrochloric-acid water, and a few fragments of granulated zinc. A portion of the water is then distilled as estimated for phenol by the bromine process. The zinc enables the boiling to be carried on steadily, and the bubbles of hydrogen keep the gauze from matting together. Results were submitted which prove that the process is accurate.

This paper was given in abstract by Dr. Attfield. An interesting episode immediately followed, Professor Prescott, of Ann Arbor, being introduced to the meeting by the President, and the Professor, in acknowledging the hearty reception given to him by the meeting, made a speech of fraternal greeting on behalf of American pharmacy. Professor Prescott's strong individuality and natural eloquence much charmed the members. The way was now clear for the discussion on

Standardisation.

This was resumed by Dr. Attfield. It will be useful to recall what was said on Monday afternoon, when Mr. Maben opened the discussion with the cogent remark that in times past, when standardisation was undreamt of, bad drugs and good drugs existed, and the reputation of any medicine was based on good drugs. Standardisation, said he, is merely the modern means for selecting the good drugs. Dr. Griffiths, who followed him, happens to be a Minor man as well as a medical practitioner, and his remarks on drugs were particularly interesting. He submitted that while an alkaloid may have a definite action, in general practice doctors have to rely upon experience, and his experience was altogether in favour of galenical preparations of drugs being better than the alkaloid. If, he said, we can have the virtues of opium represented in a reliable liquor opii sedativus, that is far better than morphine *per se*. Dr. MacWalter, who followed him, was, perhaps purposely, extravagant in his statements, and his charges against the standardised preparations of opium and belladonna aroused such antipathy that it was not altogether the approach of the closing hour, we thought, that inspired Dr. Attfield to move the adjournment of the discussion. The Editor of the Pharmacopœia gave the meeting the benefit of his intimacy with the medical practitioners by telling the meeting what they want—viz, definite action to be represented in the medicines which they administer. Mr. Patrick Kelly submitted that the alkaloid no more represents all the effects of a drug than a cup of tea without sugar and milk is the pleasantest representation of the Irish national beverage. Mr. Naylor and Mr. J. C. Umney next presented points from their exceptional experience, and Professor Prescott again entranced the meeting by his graphic presentation of the facts, showing that physiological action has largely been determined with chemical individuals, and not with drugs themselves, whose action no more depends upon one constituent than harmony does on one tone or colour on one primary colour.

Distillation and Boiling Points.

In continuance of their observations on this subject at the London meeting of the Conference, Messrs. Thomas and Charles T. Tyrer submitted an exceedingly interesting paper, in which they described how the recorded temperature of distillation differs with the position in which the thermometer is placed in the flask or boiling-tube. They submitted a large number of sketches, which we reproduce. The differences, though slight in some cases, are sufficient, because they warrant more careful attention to the subject, especially on the part of the Pharmacopœial authorities.

Mercury and Bismuth Salts.

Messrs. T & C. T. Tyrer have compared the hypophosphorous-acid method of determining mercury in its salts with other reduction methods—namely, with stannous chloride, formaldehyde, sodium arsenite, tartar emetic and phosphorous acid, and they have proved that the hypophosphorous method is by far the best, both in surety of reduction, and in easiness of manipulation. They give comparative figures from which the accuracy of their conclusions may be judged. The approved method consists of dissolving a quantity of the mercurial salt in nitro-hydrochloric acid, adding caustic soda until a permanent precipitate is formed, then hypophosphoric acid to the formation of acidity. This is boiled until it becomes black, and the whole is connected on a filter, washed with alcohol and ether and dried. They also showed that the same method, using hydrochloric acid as the initial solvent, is admirably adapted for the estimation of bismuth salts.

Acids in Glass Bottles.

It is generally understood that the mineral acids act upon a glass appreciably. Messrs. T. & C. T. Tyrer reported upon the influences of sulphuric, hydrochloric, nitric, and hydrobromic acid, in which the quart bottles made of green, white, amber, and blue glass were allowed to stand for several months in a diffused light on the laboratory shelf, and at the end of that time the acids were tested, and none of them showed an appreciably or decreased residue In fact, they did not dissolve anything.

Mr. Tyrer gave the gist of these papers in his own inimitable way and added many things, such as a statement to the effect that we (pharmacy and chemistry) are a masonic concern, the public being outside. There was no discussion on these papers nor on the next two.

Hydrastin

is one of the latest additions to the B.P.C. Formulary, and Mr. Thomas Maben, in a lengthy paper, described the origin of this so-called concentration or dry extract, and gave a good deal of useful information respecting the two alkaloids of golden seal—namely, berberine and hydrastine. The rhizome varies considerably in hydrastine-value, and, as this is the sole important alkaloid, he recommended that a standard of 2 per cent. should be insisted upon, and gave good reasons for considering the total alkaloids, as in this case, a useful factor. Methods of estimating the alkaloids were described, and the paper concluded with a protest against the formulary method of manufacture. In the United States, strong alcohol is employed for exhausting the drug, and the dry residue from the tincture constitutes hydrastin; but the formulary used 60-per-cent. alcohol, whereby a hygroscopic extract is obtained.

Ergot.

Dr. J. C. McWalter speaks very disparagingly of the British Pharmacopœia preparations of ergot in the paper which he read to the Conference, and not quite consistently either, for in one part he condemned ergotin and in another the old Dublin tincture, which was prepared on somewhat similar lines. Speaking as a physician he considers that the liquid extract is therapeutically useless, and suggests that a better preparation might be made by dissolving 1 part of the solid extract, or ergotin, in 5 parts of a mixture of glycerin and water.

Concentrated Liquors.

In this Mr. F. C. J. Bird described experiments which he has made with the view of improving the official process for liquor calumbæ conc. It gave many interesting details, and suggested that the calumba-liquor is improved by making it with chloroform-water instead of distilled water, and making the second sufficient with the first for 16 oz., allowing suspended matter to deposit, then heating to 212°, making up to 16 oz. with sterilised water before adding alcohol and filtering. Mr. Bird also reported on liq. senegæ conc., saying that it is satisfactory when the full amount of alcohol is present. Along with this paper was considered one on

Liquor Gentianæ Comp. Conc.

In this year's B.P.C. Formulary a recipe is given for making a 1 to 7 concentrated compound infusion of gentian. Nevertheless, a member of the Formulary Committee, Mr. R. A. Wright, and his collaborator, Mr. E. H. Farr, communicated to the Conference a paper on the subject, and it requires little perception to judge that the recognised formula has not found place without internal as well as external protest. Messrs. Farr and Wright in their paper tell, first, the amount of extractive matter obtained from the solid constituents of British Pharmacopœia compound infusion of gentian when treated as directed in the B.P. They then describe experiments that they have made with ten formulæ differing either in constituents or in the manner of extraction, and gave notes in respect to each, as well as the amount of extractive found in each. The best concentrated preparation, so far as flavour is concerned, was obtained from a formula resembling that adopted by the Formulary Committee, differing in excluding dried lemon-peel, but including double the amount of tincture of lemon. For comparison with that formula we reproduce here the B.P.C. formula referred to :—

Gentian-root in No. 20 powder ...	2 oz.
Dried bitter orange-peel	2 oz.
Dried lemon-peel	1 oz.
Tincture of fresh lemon-peel ...	1 fl. oz.
Alcohol (90 per cent.)	4 fl. oz.
Distilled water	a sufficient quantity.

Mix the gentian, bitter orange, and dried lemon-peel, and pour over them 20 fl. oz of distilled water; macerate twenty-four hours and press off the liquor. Reserve 10 fl oz., and add to it the tincture of lemon-peel and the alcohol. Treat the marc with two further macerations of 20 fl. oz. of distilled water for six hours each; press off, and mix the liquors, adding any left from the first maceration. Evaporate to 5 fl. oz., and add it to the first portion to make 1 pint.

This is eight times the strength of B.P. Infusum Gentianæ Compositum.

Dose—½ to 1 fl. drachm.

Dr. Attfield almost diverted discussion from the topics of the papers by asking why Messrs. Farr and Wright give 1-to-7 preparations when 1 to 9 is consonant with the tendencies of the day. To this Mr. Martin and Dr. Symes replied that 1 to 7 is wanted, and there is no demand for the 1 to 9. Mr. Brodie advocated cold-water percolation in preference to maceration and pressure. The use of chloroform-water, as suggested by Mr. Bird, was commended, but Dr. McWalter pointed out some little troubles that may arise from such use.

Poor-law Medicines were the subject of an able paper by Prof. Tichborne, in which he reported on the work which he has done during the past two years, and which shows over 10 per cent. of adulteration. Many excellent notes on testing were given in this, and as the paper was illustrated with specimens it created much interest. Mr. Brunker, who speaks with authority as a Government official, stated that adulteration has decreased to 3 per cent. The speech of the debate was that of Sir Thos. Robinson, who exposed the weaknesses of the Irish poor-law-contract system, and Prof. Prescott's contribution as to testing for wood spt. was interesting, this ending the practical discussions of the day, owing to the shortness of time.

Sweet Spirit of Nitre.

This perennial subject was brought before the Conference once more by Messrs. Farr and Wright in a paper on the causes of the loss in strength of the spirit on keeping. Both the London Pharmacopœia spirit and the British Pharmacopœia one were experimented with, and the conclusions by Harvey recently published in The Chemist and Druggist were confirmed in the main; but the authors find that diffused light, however bright, has no chemical action on the spirit, but that exposure to direct sunlight is fatal.

Arsenic in Reduced Iron.

Mr. E. S. Peck, M.A., the new Honorary Secretary of the Society, gave the Conference another example of his patience by submitting a third paper on reduced iron. In the present one he tells how the amount of arsenic in this product may be estimated by comparing the colour produced by mixing a hydrochloric solution and the iron with stannous chloride solution, and comparing the colour produced, which varies from light-grey to brown. The test is the German Pharmacopœia one, and by means of it Mr. Peck detected arsenic in six samples out of sixteen to the extent of 0·01516 per cent. to 0·379 per cent.

Soluble Manganese and Iron Compounds.

In a paper entitled "A Soluble Manganese Citrate and some Compounds of Manganese with Iron," Dr. F. B. Power described how the compounds can be prepared. Manganese citrate is first made by precipitating manganese carbonate from the sulphate with sodium carbonate, dissolving the precipitate in a solution of citric acid, filtering, and drying if desired. The salt is made soluble by adding sodium citrate in molecular proportions. Incidentally, Dr. Power showed that conflicting statements as to the precipitation of manganese by ammonia sulphohydrate in the presence of alkali citrates have arisen through lack of attention to the amount of alkali present The author then described how to prepare soluble iron and manganese citrate and phosphate by processes similar to that already described, and he commended the use of these compounds in medicine.

Iodo-tannin Compounds.

In France iodo-tannic syrup has long been used as a pleasant way of giving iodine in supposed organic combination. Dr. F. B. Power and Mr. Frank Shedden questioned if such preparations could contain an iodo-tannic compound, and they have attacked the question with great thoroughness, and conclusively proved that the iodine exists in the preparations wholly as hydriodic acid. Incidentally they showed the preparations of iodine absorbed by tannin and gallic acid in the presence of water, either in the cold or when acted upon by heat. Barnouvin, who also studied the subject about ten years ago, thought he obtained an iodo-gallic acid, but this the present authors proved to be gallic acid with a little adhering hydriodic acid.

Cardamom Fruits.

Messrs. Cowley and Catford communicated a note supplementary to that which they read to the Liverpool Chemists' Association last winter in regard to the ash-yield of cardamom-seeds. Their extended experience with Malabar, Mangalore, and Mysore fruits shows that the seeds and pericarps are best incinerated in pipe-clay crucibles. Their observations show that the proportion of seed to pericarp is highest in the Mangalore variety, and that the Malabar contain most ash, dark seeds yielding 5 per cent., and light seeds up to 9 per cent., or almost double the yield from Mysore seeds. As the pericarp-ash contains about 20 per cent. of lime, and the seed-ash little or none, it is easy to tell by incineration whether pulv. sem. card. is adulterated or not.

Uniformity in Dispensing.

Mr. A. L Doran contributed a paper on this topic, and exhibited two pieces of apparatus which, although not novel, seemed to be appreciated by the meeting.

Hydrobromic Acid, as prepared by the method recommended by Mr. F. W. Fletcher—namely, by suspending bromine in water, and passing a current of hydrogen through it—is apt to yield sulphur bromide as a by-product. Mr E. M. Marshall, of Glasgow, has thoroughly investigated this matter, and detailed to the Conference a series of reactions which take place in preparing the acid, and described a method of getting rid of the objectionable bromide. This consists in first making a small amount of hydrobromic acid by means of sulphur bromide in water, dissolving the desired quantity of bromine in the filtered acid solution and agitating with sublimed sulphur, more sulphur and bromine being successively added until the sp. gr. of the liquid is about 1·61. It is then distilled.

Test for Santonin.

Mr. Percy Pain pointed out that the British Pharmacopœia test for santonin is applicable to other substances, and he recommends that a grain or two of santonin should be dissolved in sweet spirit of nitre, and solution of potash added, when a pink colour is produced that is absolutely distinctive.

The next meeting is to be held in Dundee. The President's conduct in the chair was admirable, and the encomiums of Mr. Naylor on his retirement from the secretaryship was one of the most earnest and touching appreciations which the Conference has experienced.

British Pharmaceutical Conference

Dublin – July 29 to August 1.

ALTHOUGH the regular official programme of this Conference was not supposed to begin until Tuesday morning, July 30, by Sunday, the 28th, there was a Conference feeling in Dublin. Many had come from London and other towns between London, Holyhead, and Liverpool on Saturday, and a large contingent from Forfarshire, Edinburgh, and Glasgow arrived in Dublin on Sunday in time for the morning service, Christ Church and St. Patrick's Cathedral being the favourite places of worship.

Dr. Attfield, in ruddy health, was greeted by many old friends, who were pleased to see him renewing his youth, and said so. Mr. Charles Baker (of Messrs. Smith, Stanistreet & Co., Calcutta) gave the imperial touch to the earlier gatherings that was necessary to remind the pessimistic that interest in the Conference does not begin and end in the Square, but that the B.P.C. has a world-wide interest. Mr. W. Moore, erstwhile assistant to Dr. Attfield at headquarters, now manager to the Planters' Company's pharmacy-department in Assam, came later to support the Indian representation.

There were a few small private lunching and dining parties on Sunday, all very quiet; and on Monday morning Mr. and Mrs. Wells, Mr. Bernard, and Mr. Gill came to the Shelbourne Hotel to conduct a party of fifty over Guinness's Brewery. That was an experience worth having, and it needs little description; for, although the Local Committee were fortunate in getting special arrangements for the visitors, Messrs. A. Guinness & Son (Limited) are particularly liberal in the matter of inspection of their works, parties of visitors being conducted over them every working-day of the year.

It rained somewhat on Monday afternoon, but not unpleasantly, and members of the Local Committee were here, there, and everywhere, it seemed to us, looking after the welfare of some friend. In short, the prehistoric stage of the meeting presaged success for the week.

The Right Hon. Timothy C. Harrington, M.P.,

Lord Mayor of Dublin, who was to have been present at the opening of the Conference, but whose Parliamentary duties detained him at Westminster. This portrait was specially taken by Messrs. Lafayette, Dublin, for The Chemist and Druggist, and will serve as a souvenir of the visit of the British Pharmaceutical Conference to Dublin.

The reception at the Science and Art Museum in Kildare Street on Monday evening threatened, at one time, to be spoilt by the rain; but the weather improved, and the gathering numbered somewhat over 400. The guests were received in the vestibule of the museum by the President, Mr. G. Claridge Druce (Mayor of Oxford), who wore a Court suit and his mayoral chain, the mayoral robes having been laid aside owing to the warmth of the evening. Mrs. Francis Ransom stood on the right of Mr. Druce, and with them were Professor Attfield, Mr. Francis Ransom, Mr. and Mrs. W. F. Wells, Mr. and Mrs. Bernard, Mr. and Mrs. Beggs, Dr. and Mrs. Symes, Mr. and Mrs. N. H. Martin, and Mr. and Mrs. J. C. C. Payne. Amongst the company present we noticed Mr. James MacCann, M.P., Professor Stoker, Sir E. Hodgson, Sir Thomas and Lady Robinson, Mr. W. A. Thompson, an eminent local surgeon, Mr. Brunker, Mr. Samuel Boyd, Professor Tichborne, Mr. and Mrs. T. Ingram (Johannesburg) Mr. C. Baker (Calcutta), and most of the members of the Local Committee, the lady members of which wore white favours with gold lettering, the gentlemen wearing a similar badge but claret-coloured. The assembly was honoured by a large number of ladies, whose presence lent charm to a most attractive and enjoyable function. There was universal appreciation of the efforts of Mrs. Wells (the lady President) and Miss Grindley (the Hon. Secretary of the Ladies' Committee), and they were admirably assisted by Mrs. Beggs, Mrs. Bernard, Mrs. Frank Gill, Mrs. Conyngham, Mrs. Johnston, Mrs. Brown, Mrs. Kelly, Mrs. Grimes, Mrs. Smith, Mrs. Allen, Mrs. Walsh, and Lady Robinson. The band of the 4th Battalion of the Rifle Brigade discoursed national music in the gallery of the museum during the evening, and at intervals vocal and instrumental items were contributed by a select company. The violin solos of Miss Victoria Delany were especially accorded appreciation, and "Father O'Flynn," by Mr. Charles Kelly, provoked a storm of applause. Madame Shellard sang "Oh, dry those tears" excellently, and Messrs. Morgan, G. Shellard, Jones, and Kelly contributed quartettes. The gathering broke up at 11 o'clock, but the pleasures of the evening did not end there, for there were little reunions in most of the hotels.

The First Session.

Members of the Conference and their ladies gathered slowly at the Royal Society's house on Tuesday morning. The lecture-theatre is all that has been said about it, beautiful and comfortable. The top gallery was shut off, but the lower one (or grand circle) filled more quickly than the stalls below. There was a run upon the corners of the circle and the centre. Some of those who sat in the stalls were Messrs. Edward Evans, jun., R. A. Robinson, Albert Cooper, I. Bourdas, jun., W. Warren, Thomas Tyrer, C. Johnston (Manchester), H Gadd, Silson (Bradford), and E. S. Peck It was 10.10 when the President (Mr. G. Claridge Druce) stepped forward with Mr. W. F. Wells, and was received with applause.

The President.

Welcome to Dublin.

Mr. W. F. Wells (Chairman of the local committee) rose and said: Mr. President, Ladies and Gentlemen, Members of the Conference,—It is my privilege and my great pleasure, as Chairman of the Local Committee, to offer you, on your second visit to a Conference in Dublin, a very cordial and very hearty welcome on behalf of my colleagues and myself. (Applause.) We will try to welcome you, not in speeches, but in a practical way. (Hear, hear.) We will endeavour to make your visit to Dublin—the capital of Ireland, and which, notwithstanding what you have heard in other parts of his Majesty's dominions—is beyond all doubt the second city of the Empire, pleasant. (Laughter and applause.) That question was debated in Glasgow and in Liverpool—(laughter)—and although I thought it best to hold my tongue there, on the present occasion I have no fear in asserting that it is the second city in the Empire. (Laughter and applause.) Well, I am very glad to welcome the Conference here, because I feel that that bond of union has not existed between English pharmacists—perhaps British pharmacists would better express what I mean—and Irish pharmacists that there ought to be. There is only a small stretch of water between us, yet that union has not existed that there should be. (Hear, hear.) However, I recollect that the previous Conference held in Dublin did an immense amount of good in creating goodwill and personal feeling between British and Irish pharmacists—(hear, hear)—and we have great hopes that this visit will render that bond of friendship very much stronger. I regret very much that the Right Hon. the Lord Mayor is not here this morning, for he could give you a very much stronger welcome, as Chief Magistrate, to this city than I could do. His Lordship is in London. He was to have been present last night and also this morning, and he intended to be with us at luncheon to-day and to-morrow; but there is a Bill before Parliament of great importance to the city of Dublin, and his Lordship, as Chief Magistrate of Dublin, must be there in connection with that Bill. Otherwise he would be here. (Hear, hear.) We (the committee) feel deeply indebted to the Lord Mayor for the kind way in which he met the committee in their desire to make your visit to Dublin a success. (Applause.) We had great difficulty in getting rooms for the luncheons to-day and to-morrow, and when we went to the Lord Mayor on the subject he in the most handsome manner offered us the use of the Mansion House. (Applause.) When you have your luncheon in that fine room to-day you will realise the great privilege the Lord Mayor has conferred upon us, and that makes our regret all the greater that he is not here. Personally, now I would like to say how pleased we (Irish pharmacists) are to see you, Mr. President, in the chair. (Applause.) In you, Mr. President, we have a man who is not only a great scientific gentleman, but is a working pharmacist. Now, I want to say a word to the ladies. On behalf of the Ladies' Committee I am deputed to say that they are delighted to see so many ladies here, and if the lady visitors will put themselves in touch with the Ladies' Committee, it will be happy to do what it can to make this visit to Dublin one that will not be forgotten. (Loud applause.)

Mr. R J. Moss, Registrar of the Royal Dublin Society, then said: Mr. President, Ladies and Gentlemen,—Allow me to assure you that it was with very great pleasure the Council of the Royal Dublin Society granted to the Conference the use of this theatre, and also to assure you that they wish the Conference a most hearty welcome. (Applause.)

Mr. G. D. Beggs (President of the Pharmaceutical Society of Ireland) said: Mr. President, Ladies, and Gentlemen,—On looking over our programme I find, sir, that there has been a slight omission. But in all such functions as this the Managing Committee is supposed to be equal to every and any emergency, and in the present instance I stand in that position, and what I am now about to say will be an extra item in our programme. (Laughter.) I feel I would be lacking in my duty, as President of the Pharmaceutical Society of Ireland, were I not to offer to this Conference a very hearty welcome to the city of Dublin. (Hear, hear.) I will not extol the beauties and merits of the city—I will let the visitors find these out for themselves—but on behalf, not alone of every member of our Society, but of every pharmacist in Dublin and the South of Ireland, I welcome you to the city. I voice their wish by saying we wish you a very hearty welcome indeed to Dublin. (Applause.) For other reasons I am proud to stand here, as I had the pleasure and the honour to offer you the invitation to Dublin in London. (Hear, hear.) I then promised you many things, and as a man of honour—(laughter)—as an Irishman first—(much laughter)—I say I would not be doing my duty here did I not welcome you from this platform to-day. I have little further to say more than this, that our committee have worked zealously and hard to make this Conference a success, and if any member of the Conference should think it is not a success, I assure you it is not for want of trying to make it so on the part of the committee. (Applause.)

The President of the Conference (Mr. Druce) then said: Ladies and Gentlemen,—I am sure, after having heard these three eloquent Irish speeches of welcome to the members of the Conference, it remains for me to say (on behalf of the Conference) how much we thank the speakers and the Dublin committee for their kind welcome. (Applause.) We know what the committee had to do. We know how difficult it is for an executive committee to get all the details into shape, and we have seen the complete way in which the Dublin committee have done their work. (Hear, hear.) Those who have had experience of an Irish welcome before will feel that it gives us a taste for Irish things to desire more; and when, during the course of the next twenty years another visit has been paid to Ireland, whether Dublin will be the first or second city in the Empire I will not venture to predict. (Laughter and applause.) I also thank the Royal Dublin Society for the kind welcome extended to us on their behalf by Mr. Moss—(applause)—and it is to the Society we must all feel grateful when we see how excellently this room is adapted for the holding of this Conference. (Applause.) I believe that an old member of our Society, Mr. A. J. Moore, who was a prominent figure when the Conference last met in Dublin, was connected with the Royal Dublin Society. (Hear, hear.) Now, ladies and gentlemen, I will venture to ask your indulgence while I deliver my address. When I spoke as to the length of the address to Mr. Naylor (Secretary) he said that my address should not take up more than four and a half hours. (Laughter.) I will try to make myself heard as well as I can, but if any members in the distance cannot hear me will they put up one hand; and when they are tired of hearing me will they put up both hands? (Laughter.) Mr. Druce then proceeded to deliver his address, beginning at exactly 10.23 A.M., when over 200 ladies and gentlemen were present. He skipped parts of it here and there, and although it was 11.43 before he uttered the last word amidst great applause, there was little appearance of weariness in the audience.

Presidential Address.

Twenty-three years have rolled by since this Conference met in the capital city of the Emerald Isle, and enjoyed the proverbial hospitalities of its generous and warm-hearted people. The chair which by your great kindness I occupy to-day was then filled by an eminent pharmacist, Mr. George Frederick Schacht, whose unwearied efforts in the cause of pharmaceutical education deserve our unstinted praise and gratitude. He is one whose memory we Conference members especially hold in high esteem, since this Conference is to a great extent an offspring of his own, as in 1852 he suggested the advisability of founding a peripatetic annual meeting for the discussion of scientific objects connected with pharmacy, and although the scheme was not then adopted, yet shortly after, in a modified form, it was established, and the first meeting was held in 1863 at Newcastle-on-Tyne, under the presidency of Henry Deane, of Clapham.

At Dublin, as you are aware, Mr. Schacht gave an interesting sketch of a business-life of a pharmacist, in which the work during a four years' apprenticeship and the period devoted to scientific study as an assistant in an historic pharmacy, prior to entering upon a business career, were described. The special point insisted upon in the address was that the modern pharmacist must be impressed with a high ideal of the duty of his calling, and that this calling is to be looked upon rather as a trust than a personal possession. Gentlemen, after twenty-three years' experience, can we venture to assert that proposition, or have we to modify that definition to-day? Can we say that we are nearer to the ideal, or are we obliged to admit that in many ways, from varying causes, our ideal has lost the clear sharp outline, and that at the beginning of the twentieth century the image of perfection has become blurred and indistinct, which in the preceding century we hoped was being brought into a sharp focus? If so, can we recast the die and use the graver's tool once again to make the impression sharp and true? Let me draw your attention for a few moments to the condition of the Conference then and now. Of the officers who were here twenty-three years ago we have lost our President, and of the five Vice-Presidents who had filled the chair only one to-day survives—and now I venture to ask you to send a telegram of hearty good wishes to Thomas B. Groves—who has been a most hearty supporter of the Conference, and who by his scientific work has done much to raise the standard of our calling. But, to our regret, we have lost the genial Bentley, who for so many years did so much to advance the knowledge of botany among pharmacists, and whose manual was written on such excellent lines, and who in his address at the Nottingham meeting in 1866 put very strongly before pharmacists the claims that botany has for a place in our course of study; Stoddart, of Bristol, whose facile pen explained the botanical and geological features of his charming district, and who in may ways might be taken as the type of the ideal which his fellow-townsman sketched in the address given in this city; Henry Brady, a man of more specialised knowledge, whose researches on foraminifera, especially those printed in the report of the *Challenger* expedition, made him well worthy of the blue ribbon of scientific distinction in being admitted a Fellow of the Royal Society; and, last, but by no means least, Redwood, the professor of pharmacy, gave distinction and position to the art we follow, and has left his place unfilled, while his subject occupies, most unfortunately, a less conspicuous position to-day in our curriculum of study.

The financial statement of the Conference read in 1878 showed that 757*l.* was received in the year, equal to a membership of over 2,000, with which our present list, after nearly a quarter of a century's system of compulsory pharmaceutical examination, bears a very unfavourable comparison. What is the cause? Has the compulsory system of examination resulted in a dead level of uninteresting and unintellectual mediocrity? Has the toil and stress of business occupation been so much increased as to numb the higher faculties and to enervate the desire to become proficient in scientific attainments? Or has the upas tree of company-trading, which has assumed such enormous and overshadowing and unhealthy proportions, been the factor which has exerted this malevolent influence, and in many instances converted one who would have been an intelligent and independent pharmacist into a mere qualifying dummy, not more interested in the use and properties of the medicaments he is supposed to control the sale of than a penny-in-the-slot automaton?

For the present I will attempt to give no reason for this falling-off in the numbers of our membership-roll, but I will make a strong appeal to my brother pharmacists in this vast empire to support us, since we know that the work this Conference has done in furthering scientific pharmacy has been very great, that in the long series of *Year-books*, which have been published under its direction, the epitome of work of the year has been presented, and the result of much really good and scientific advancement in our knowledge of pharmacy has been presented to the members. The Committee believe that by bringing the *Year-book* more fully up to modern requirements that it may be made a necessary and desirable adjunct to every pharmacy.

This Conference does not discuss politics, even of a pharmaceutical character, so that every pharmacist in the empire may join its roll without compromising any opinion or subscribing to any article. I trust this Dublin meeting may see a large accession to our ranks.

In all ages of history the followers of our business have been noted for narrow means, while the occupation has perhaps more than any other, been of a sedentary character, and has led to an attention to small details which necessarily leaves the trace upon the individual, and has led, perhaps, to making our mental horizon a limited one.

Progress of Pharmacy in the Last Century.

At the beginning of a new century it may be well for us to take stock of the progress we have made and to note in what special ways and to what degrees our empire, which now covers so immense an area as to be figuratively described as one which is bathed in perpetual sunshine, has increased in magnitude and in commercial prosperity and in scientific acquirements so that we, who occupy a very insignificant portion in this vast domain, may see if our advances are at all commensurate in extent.

Let us recall for a moment the condition of things at the beginning of the nineteenth century. A large and important slice of our colonial dominions had recently been severed from us, but the importance of which was not then realised, for who could have foretold the immense growth in potential wealth, in commercial prosperity, and in scientific enterprise which characterises the United States of America to-day? Correlated with this secession was that terrible struggle with our French neighbours, a conflict which had been working prejudicially against the advancement of science for many years, and was destined to continue its malevolent influence for many years to come. Although this century begins with a war-cloud hanging over it, we may feel very grateful that another continent has not repeated the historical episode, and that no loss of territory characterises the advent of a new century, and, notwithstanding the increase in taxation, that at the present time we have no such strain upon our resources as was felt by our progenitors from the effects of the French war. We may fervently pray that never again may the two great nations, which have so many things in common, with such enormous commercial interests at stake, and one so complementary to the other, be again led to the fratricidal arbitrament of arms, but that if they please they may vie to the utmost in colonial expansion, and especially in scientific research, because science, with its ever-widening radiations, and with its ever-increasing spread among civilised peoples, is one of the most powerful agents in linking in peaceful bonds the nations of the world.

In the comparatively limited time at our disposal it would be a physical impossibility to touch upon even the more important scientific discoveries made during the century, but we may be allowed to glance at the most striking advances which have been made in the knowledge of those sciences which are more intimately connected with our own calling, and chiefly those which are claimed to be the groundwork of our examination system, and which I think to some extent are occupying a too dominant feature in the present Qualifying examination.

Discoveries in Science.

If we enumerate anything like the chief discoveries of science in the nineteenth century we are astounded at their extent, and we are apt to think that progress has been more marked than during any preceding century of the world's history. But we must remember that there is such a thing as a mental as well as a scenic perspective. The last valley we traverse from brow to brow, when looked upon from some contiguous height appears deeper and wider than those in the farther distance, even if they are of the same extent, and this process goes on until those remote, which may be equally important with the one nearest to us, sink into a dead level of uniformity in which all gradations of altitude and all expanse of breadth are lost to the vision. It is so to a great extent with our mental estimate, yet we should not be surprised to find that in scientific and material progress there is an ever-accelerating speed and an ever-widening zone to occupy, for the periphery must be of greater dimensions as it is pushed outwards from the centre. If we remember for a moment that the population of England and Wales at the beginning of the nineteenth century was under 9,000,000, and Scotland in round figures was about 1,600,000, and that Ireland is estimated to have been about 6,000,000, while at the end of the century the population of England and Wales had increased by over 21,000,000, and Scotland by over 3,000,000, and although Ireland had decreased by 2,000,000, yet on the whole what an enormous addition has been made in the population of the United Kingdom If this is true of the centre, what is the case with the British dependencies? At the present time the area of Greater Britain is as great as that of four Europes, containing a population of 400,000,000, of whom outside the British Isles some 10,000,000 are white people, so that not more than a tenth of the total population are white. A mere list of the names of the various possessions added to the British Empire during the century would take a very considerable space, but when one recollects that nearly, if not quite, all our African settlements and possessions have been the product of the century's expansion, while that enormous tract of India, including the Punjaub, Scind, Pegu, Burmah, Oude, &c., belong to the same category—in fact, the population of British India was in 1800 estimated at about 12,000,000 or 14,000,000—it will be seen how immense has been the increase. In Australia the same process has gone on, and now the Antipodes, which were in the early days of the century the mere dumping-ground for our criminal population, in which horrors unspeakable found a place, now the same geographical area is occupied by a law-abiding, loyal, and intellectual race, which has founded towns and cities, one of which at least is larger and more important than was any town in Britain in 1800, save London alone. The increase of people in the land of the blue gum have also its prototype in another hemisphere, for the home of the maple and spruce, Canada and British Columbia, are now more important than the whole of our North American possessions were before the War of Independence resulted in the loss to us of such a valuable portion of territory as that which now constitutes the United States, which, although separated from us as to forms of government, are united to us in close bonds of amity, and with common ideas and language.

As showing that side by side with growth of area and of population commerce has advanced *pari passu*, we may instance the fact that our exports and imports have risen from 86,000,000*l*. in 1810 to 815,000,000*l*. in 1900. The condition of Britain may be imagined when we remember that in 1800 wheat was 113*s*. a quarter, and Consols stood at 62, and great suffering was endured by the poorer inhabitants of agricultural districts and manufacturing towns. The great mass of the people of these isles were uneducated, the percentage of illiterates being truly appalling, and crime was very prevalent in spite of the inhumanity of a barbarous penal code.

Extension of Empire and Shrinkage of Distance.

Notwithstanding the enormous increase in the size and importance of the British Empire in the last hundred years, the introduction of steamships and the formation of telegraphs have assisted to make the empire in 1900 much more homogeneous and more easily governed than were the British possessions in 1800, when we were separated from India by a six months' journey round the Cape, and which has since become a forty, and then a thirty, days' journey through Egypt; by degrees this also has become shortened by better railway accommodation over the Continent to Brindisi, and by the facilities offered in an unbroken journey through the Suez Canal (which the introduction of electric lighting itself has shortened no less than six hours), until now the mails and special passengers may reach London within twelve or fourteen days after starting from Bombay. The four months' time which separated us from Australia has diminished to about a month, and the journey has been accomplished in twenty-eight days. Even the latter half of the nineteenth century has seen the Atlantic Ocean voyage shrink to a moiety of the period suffered by our grandfathers, and we have to thank Belfast for some of this expedition. Added to this shortening of the distances which separate one part of the country from another must be added the power which the electric telegraph wields in bringing each portion of the empire in direct touch with the central authority, and it will be seen that such a great and important portion of our possessions as India is really now as close to London as the Outer Hebrides were to the War Minister of Lord Addington's Government in 1802.

To steam and electricity, therefore, are due this wonderful shrinkage in the size of the world, which has such profoundly modifying and far-reaching influences upon commerce and civilisation, and the full effects of which are not yet realised.

Linked to these, and dependent upon the former, is the system of postal distribution, which participates to the full in the advantage of rapid and low-priced transit, and the enormous extension of which is most astonishing, no fewer than 2,246,800,000 letters being delivered in the U.K. alone. For 1*d*. a letter can be now sent to New Zealand, and a postcard has circumnavigated the globe in sixty-four days—even a more rapid journey than the brilliant sketch by Jules Verne told of in fiction about twenty years ago. Year by year the area occupied by the penny unit of postage increases its diameter, and the signs of a universal penny post are in the air, and this very desirable thing will probably be an accomplished fact before many decades pass away.

Let us glance at the progress in some few departments of science and in its applications, for if distant places have been brought nearer and the world thus made smaller, and the peoples brought into closer touch with each other, so contrariwise, on the other hand, has our knowledge of far-distant things been made more accurate, our information about other times and climes than our own made more precise and thorough, and the hidden mysteries of nature and science been partly unveiled to our gaze. With this unveiling of nature, done as it should be with all reverence, man stands appalled at the vision opened out for his inspection, and, while remembering that our senses of taste and of smell have scarcely become more sensitive or enlarged in range, it must also be borne in mind that our power of vision has been greatly increased—we can by the aid of the telescope see farther than our ancestors, we can with the aid of the spectroscope see more deeply into the hidden nature of things, and with the assistance of the microscope we are enabled to differentiate forms of animate nature which moved unseen by the scientist of the early days of the nineteenth century.

A great cardinal difference between the early and the closing years of the century is that while in the earlier part scientists looked upon the various branches of animate life and the various forces of the physical world as separate and distinct, and that each living organism was the product of a specific act of creation, in the closing years of the nineteenth century the philosopher or the naturalist sees, or tries to see, the mutual relation of one form to the other or of one force to the other—sees, in fact, a universe itself linked with other systems, sees the mutual interdependence of one form of organic life with the other, and the essential unity of life in all living things. In the body politic this truth appears to be slowly penetrating, although so far as commercial interests of pharmacists are concerned we can find no trace that such an idea has ever influenced the Legislature.

The same idea has been supported by the researches of Darwin in natural science and of such chemists as Dalton, Newlands, and Mendeléeff, and such physicists as Joule, who by his determination of the mechanical equivalent of heat in 1843, and the law of the conservation of energy, which he developed in 1847; these two laws, with Newton's law of the conservation of momentum, and Dalton's law of the conservation of chemical elements, have laid the mechanical foundation for physical science, and, so far, the result of the investigations into the correlation of the physical forces has established the mutual dependence and the convertibility into each other of all the natural forces. Moreover, we have learnt that instead of the violent cataclysms of change which the earlier philosophers considered to be the means by which advances were made, that nature works by slow and orderly progression, ever advancing, and ever improving, yet so slowly that to-day hardly differs from yesterday.

The advances in mechanical construction and engineering during the century are somewhat outside our consideration, and I cannot, after so able an exposition on electrical progress as that which our erstwhile *confrère* Mr. Joseph Wilson Swan gave to the Society of Chemical Industry in Glasgow last week, venture upon that interesting subject, or to speak of the developments in British industrial chemistry, which has seen many changes in the century. I shall rather confine my attention to those matters which are closely related to the art and practice of pharmacy.

Photography.

Although the action of the solar rays upon various substances had been known from distant times, and although Scheele and others had studied the reducing effects upon nitrate of silver exerted by exposure to light, it was not until 1802 that Wedgwood gave an account of "A Method of Copying Paintings upon Glass and of Making Profiles by the Agency of Light upon Nitrate of Silver, with Observations by H. Davy," to the *Journal of the Royal Institution*, and in 1813 that Joseph Nicèphore Niepee demonstrated a definite photographic process, which consisted in coating a metal plate with a solution of asphalt in oil of lavender and exposing this in a camera for a prolonged time, as much as several hours being necessary. The unaltered asphalt was subsequently dissolved away by means of a mixture of white petroleum to which 10 per cent. of lavender oil had been added. Daguerre and Niepee later employed a solution of the residue left on evaporating oil of lavender dissolved in ether or alcohol. With this solution a silver plate was coated and exposed in the camera, but even with this more sensitive medium three hours' exposure was necessary. The vapour of petroleum was used to dissolve away the unchanged resinous substance remaining on the plate.

In 1839 Daguerre introduced the process of photographing on silver-plated copper sheets which had been exposed to the fumes of iodine until the silver became of a golden-orange colour from the production of a film of iodide of silver. The plate was then exposed for about half an hour, and developed by subjecting the plate to the fumes of metallic mercury. The picture produced was then fixed with hyposulphite of soda. This process, known as Daguerreotype, there is good reason to believe, was, in part, the suggestion of Niepee, who for some time worked in collaboration with Daguerre. The Fox-Talbot process antedated by a month or so of Daguerre's method—and I have seen a negative taken by him in 1835—but it is essentially the same as that made known by Wedgwood in 1802 In 1841 Fox-Talbot patented a colotype process which consisted of developing a paper sensitised with iodide of potassium by means of gallic acid and nitrate of silver. Daguerre's invention was almost directly tried for astronomical purposes by Dr. Draper, who obtained a Daguerreotype picture of the moon in 1840. One of the earliest Daguerreotype portraits in existence is in the possession of Sir W. Herschel, at Littlemore, near Oxford, and it was shown at the Chicago Exhibition, when the lady of whom it was a picture was still living. Professor Bond, an astronomer of the United States, exhibited some lunar photographs at the great Exhibition of 1851. Star pictures were first obtained by Mr. W. C. Bond, of Harvard, in 1850, and in 1857 his son, Mr. G. P. Bond, started on double star measurements on sensitive plates, choosing for his purpose the pair in the tail of Ursa Major. An albumen process on glass formed the transition to the collodion process which was first suggested by Le Gray in 1850. This consisted, as you know, of a plate freshly coated with collodion, which, when still moist, was immersed in a solution of nitrate of silver; after being properly exposed, the plate was then developed with a solution of pyrogallic acid, with a small quantity of acetic acid as a restrainer, or with a mixture of ferrous sulphate acidified with acetic acid, and from this time onward for many years the collodion-process was extensively used for portraiture and for astronomical and other scientific and artistic purposes. The prominences of the sun were photographed by this process by De la Rue in 1860, and in 1869 Stephen Alexander obtained for the first time a good picture of the corona, and thus the true nature of the prominences and the corona were finally ascertained.

Eventually moist collodion plates which would keep for a few days were introduced, as the difficulties in freshly sensitising plates before exposure when away from the studio were very great drawbacks. In this process nitrate of zinc, a very hygroscopic salt, was used to retain the moist condition. Gradually the way was led to the introduction of the dry plate by M. Gaudin in 1854, in which the sensitised collodion film on the plate was preserved by protecting it with a second film of albumen. About 1860 the alkaline developer was introduced, and this method led to the employment of bromide instead of iodide of silver, and the developer used was either pyrogallic acid, or, as Abney pointed out in 1880, hydrokinone was even more effective. In 1871 Dr. R. L. Maddox, instead of emulsifying the silver salt in collodion, used a solution of gelatin, and this idea has been in various ways improved upon until we have the rapid, and portable, and durable plate so well known to us all. It may be worth while to mention that it was found by Mr. Joseph Wilson Swan, a pharmacist, that by raising the temperature of the vessel in which the emulsion—consisting of iodide and bromide of potassium, nitrate of silver, gelatin, and water—was being prepared, and keeping it boiling from half to one hour, the resulting product became extremely sensitive, and thus very rapid plates were able to to be produced, so that from the half hour which a Daguerreotype required for exposure plates are now made so sensitive as to record the exposure of two-thousandths of a second. Since the first star-photographs were obtained a large number of the minor planets have been discovered by the aid of photography, the very important discovery of the Röntgen rays has proved of great value to surgery, and by the use of photography the resulting skiagraphs are capable of being studied at leisure or preserved for reference. Besides these, photography has been enlisted as a willing servant into microscopical and physical investigations, and has been employed for the purpose of automatic registration in many branches of natural science, and in the arts and crafts. Colour photography, too, is being brought within the range of practical adoption instead of remaining a mere dream of the scientist or toy of the experimentalist.

The sale of photographic materials is a branch of business that pharmacists have largely taken up, and it is quite within their scope, since it needs scientific knowledge and accuracy and delicacy of manipulation. We may well adopt the motto once suggested by a Chancellor of the Exchequer, although not in the sense he meant, "Ex luce lucellum."

Chemistry

existed as a science long before the beginning of last century, but its development during the period we are glancing at has been phenomenally great. Not only have large numbers of new elements been discovered, but some which were suspected to exist have been isolated from their compounds, and many others known only in the gaseous state have been condensed into a solid state. The great domain of organic chemistry has been unfolded to our view. Various laws have been propounded which have crystallised nebulous ideas into a definite form, and arts, commerce, and the health of the nation have been increased by important discoveries in this fascinating science. Our Pharmacopœia gives a list of thirty-two elements, including gold, silver, copper, sulphur, lead, zinc, iron, carbon, tin, and mercury, which have been known from very ancient times. Of the remainder, no fewer than eleven were added to the list of elements during the last century. Our countryman Sir Humphry Davy's discoveries stand conspicuous, since we owe to him the isolation of calcium, potassium, sodium, and magnesium, the last an important adjunct to the photographic chemist's business. Davy also first clearly demonstrated the elementary character of chlorine and barium. Aluminium was first isolated by Woehler in 1827, and few could have anticipated that it would be produced in such enormous quantities and be put to such varied uses, nor should we have ventured to predict that one of the results of the discovery would have been the destruction of the beautiful Falls of Foyers in Scotland, and yet this utilitarian age has used the water-power from that source for the purpose of obtaining the electric current to reduce from its salt this particular light and pliant metal. Iodine, now so extensively used in the arts and medicine, was isolated by Courtois in 1811, and it is especially pleasing to pharmacists that the improved method of its preparation was suggested by a former genial President of this Conference, whose travels into the western islands of Scotland in search of rich beds of seaweed some of us have heard him dilate in his charmingly realistic style. Lithium was discovered by Arfvedson in 1817 in the mineral petalite, and its salts have become of great interest to pharmacy. Cerium was first positively identified in 1803, and its oxalate has a somewhat extensive use. In addition to the official elements, another discovered by Davy in 1808—namely, strontium—affords salts of great value to the pyrotechnist, and the bromide and iodide are now frequently prescribed by therapeutists. Although the element fluorine was long suspected to exist, its isolation has only recently been effected by the brilliant work of Moissan with the electric furnace. I need not further allude to the large series of the minor elements which have been discovered since the year 1800, for, as is now the case with the discovery of a new asteroid, the finding of an additional one creates but little enthusiasm, but it may be that among the highly radio-active elements obtained from pitchblende, substances of great interest to the photographer may be obtained. Among the minor elements one ought, perhaps, to name thallium, discovered by Crookes in 1861, on account of its interesting spectrum; and selenium, discovered by Berzelius in 1817, is of extreme importance from its curious property of being a non-conductor of electricity under normal conditions and in the absence of light, but under the influence of light becomes increasingly conductive. This property has been taken advantage of in order to steer a submarine boat by impinging upon a selenium-plate the beam from a search-light situated on the shore, and the same property has been utilised in order to transmit from one place to another a picture of a living object, so that it is stated a picture, say, of a person in Paris may be seen by another in Orleans, while they are actually conversing with each other through the telephone.

Several gaseous elements have been added to the list during the century, and our own countrymen, Lord Rayleigh and Professor Ramsay, have succeeded in isolating argon and helium, a discovery so nearly forestalled by Cavendish almost a century before. The gas given off by the hot wells at Bath contains a considerable percentage of helium, and it may be worth inquiry whether the comparatively large quantity of gas which the French chemists estimate as azote, given off by the thermal springs of Hammam Mesquotine, in Northern Africa, may not contain the same element in even larger proportions.

I cannot venture to tell you in detail what has been done during the century in converting substances previously known only in the gaseous state into the liquid, and, in most instances, solid forms. Pictet, of Geneva, Olszsewski, Dewar, and others have done excellent service in this field, and Dewar's liquefaction and solidification of hydrogen, with the researches correlated to it, have brought us within a few degrees of the zero of temperature—the cold of that interstellar space—

> That lucid interspace of world and world,
> Where never creeps a cloud or moves a wind,
> Nor ever falls the least white star of snow,
> Nor ever lowest rolling thunder moans,
> Nor sound of human sorrow mounts to mar
> The sacred everlasting calm.

In this low temperature of liquid hydrogen the pulses of life are stilled, and chemical action slows down, so that phosphorus and oxygen remain together unchanged, and fluorine scarcely reacts with elements with which at ordinary temperatures it combines with in such a furious manner.

Lord Kelvin's suggestion that life may have conceivably been brought to this planet by some meteoric visitor was by some scientists held to be impossible, inasmuch as even if it could have resisted the heat created by the passing of the meteor through our atmosphere the seed, or spore itself, would have been previously killed by the cold of interstellar space. This latter portion of the argument is negatived by Dewar and Horace Brown's experiments with seeds, which germinated after six hours' immersion in liquid hydrogen, temperature 453° F. below melting ice.

Laws of vital importance have been formulated during the century which have lifted chemistry into the exact sciences. I need only allude to Dalton's atomic theory, first suggested in 1804, and more fully expounded in 1807. To Dalton we also owe the first attempt to represent, by means of symbols, the composition of chemical substances; but it is to Berzelius we are indebted, in 1811, for the first employment of letters of the alphabet for this purpose. Later on came the enunciation of the "Law of Octaves," first propounded by Mr. John A. R. Newlands in 1863–6, and developed into the Periodic law by Lothar Meyer, of Tubingen, and Mendeléeff, of St. Petersburg. It is a triumph of theoretical speculation, which, like its counterpart in the science of astronomy, has taken a dominating position. Isomeric substances were first noticed by Liebig in 1824, who found by analysis that fulminic acid has the same composition as cyanic acid. The foundation of stereo-chemistry was laid by Pasteur's researches into the properties of racemic acid. While the discoveries in inorganic chemistry during the century have been so extensive, it is, perhaps, in the domain of organic chemistry where the greatest scientific conquests have been made. If we take a branch of chemistry which is of especial interest to us—namely, the alkaloids, we shall find that all of them are the products of the nineteenth century's research. The alkaloids of cinchona bark were obtained in an impure state in 1803 by Duncan, but Pelletier and Caventou in 1820 first properly distinguished quinine and cinchonine; morphine in an impure state was obtained by Durosne in 1803, but it was left to Sertürner in 1816 to prove its basic-nature and its distinction from narcotine. The glucoside salicin was not obtained until 1830. Now the output of these three is enormous, and their use has revolutionised one extensive source of production, transferring, as it has, the culture of the cinchona from the western to the eastern hemisphere, and that culture has become so well understood that the cinchona-forests of Ceylon have come and gone during the latter half of the century; even in India the culture has ceased to be a commercial venture, and Java, in the Netherland Indies, practically supplies the world with cinchona for quinine making. The British Government still does a little in bark harvesting and quinine making, but this is mainly to bring cheap quinine into the hands of the poor natives. Not only have these and other alkaloids and similar principles been isolated during the century, but their structure and constitution have been so closely studied that in a few instances they have been synthetically prepared.

The active principles isolated are now appalling in number, and they have assisted to most widely change the character of our dispensing, since they have aided the exhibition of medicaments in a portable and concentrated form, which has resulted in the substitution of the pill or pellet for the more bulky and profitable mixture. Still more recently from the laboratory of the chemist has flowed that stream of artificial compounds, whose fearsome constitution their patentees have often used some catchword to designate, many of which possess marked therapeutic action, and are in large popular demand. The enormous amount of work on organic chemistry is utterly beyond our scope, but it may be appreciated if one consults the great work of Beilstein, the "Handbuch der Organischen Chemie," in six large octavo volumes, giving a concise guide to the organic compounds whose constitution is known, and to this may be added Richter's "Koklenstoff-Verbindungen," in two large octavo volumes and supplement.

The discovery of chloroform by Liebig in 1830, and independently by Soubeiran in 1832, led to a revolution in surgery; but this, of course, was not until its effects had been tried upon animals in 1842 by Dr. M. Glover. In 1847 the celebrated surgeon, Sir James Simpson, used it as an anæsthetic agent, and from that time to the present it has, either by itself or associated with other compounds, been most extensively used in surgical operations, with the result that not only bas a great diminution in the death-rate from operations followed, but their range has been also immensely extended, and the use of the knife or scalpel on the most sensitive portions of our frail humanity is now rendered painless The corresponding iodine-derivative, iodoform, was discovered by Serullas in 1822; but its composition was first determined by Dumas, who also made elaborate researches on chloroform, in 1834. Mosetig-Morhof introduced it as a surgical dressing in 1879, but it did not come into general use for disinfecting or antiseptic purposes until the 'eighties.

Waste-products Utilisation.

Perhaps in the utilisation of waste-products we may claim for the nineteenth century some of its greatest achievements in chemical research. Aniline was discovered by Unverderben in 1826, but it remained only as a chemical curiosity until the discovery by William Henry Perkin, when he was but a boy of 18, of the aniline colour mauve, which led the way to the production of the extraordinary series of colour-derivatives and led to the establishment of an important industry, which for a time was of great financial value to British manufacturers, but which recently has been more and more taken from us by our German competitors. Anderson's discovery of anthracene also was of great commercial importance. Linked with these discoveries from the coal-tar series was the introduction of carbolic acid and its homologues for disinfecting-purposes, and this again led to the establishment of a very large output; but the indiscriminate and unrestricted sale of carbolic acid and its dangerously poisonous nature led to a terrible death-roll, which has only been checked by the tardy action of the Privy Council in placing the sale under the same conditions which govern that of laudanum or other poisons.

High explosives are also discoveries of the time I have indicated, and one of them—trinitrin, discovered by Sobrero in 1847—has proved to be of great remedial value and a powerful agent in relieving arterial pressure, while in combination with kieselguhr it is now manufactured on an immense scale, under proper precautions and with a minimum of danger, and it is now one of the safest and most largely used explosive substances for mining-purposes. Pyroxylin, discovered by Schonbein in 1846, is in one of its modifications largely used in pharmacy under the form of a solution in ether, and other compounds with camphor form the material celluloid, which is now so extensively made for such varied uses, among which may be instanced the support for the sensitised film, which has made a revolution in another industry already mentioned.

Although the inflammable and illuminating properties of coal-gas had been known from remote ages, it was not till 1793 that W. Murdoch first manufactured gas for lighting-purposes at Birmingham, and in 1803 the Lyceum Theatre was thus illuminated. From that time till the 'eighties the amount of coal distilled for this purpose gradually increased until as much as 120,000,000 gals. of coal-tar were produced in a single year in the United Kingdom alone. Not only was there this immense amount of a single product, but a large quantity of naphthalene and other derivatives were also produced. This more powerful illuminant, which also had the advantage of saving trouble, to a very great extent drove out of use the heavy illuminating oils and candles from our larger communities. During the latter part of the century the rural districts have also changed their illuminant, as they have availed themselves of the petroleum which has been sent over in such enormous quantities from North America, especially from Pennsylvania, where the wells of oil have brought a Pactolean stream of wealth almost passing comprehension to the Rockefellers and others, and, alas! has also led to the formation of one of those gigantic commercial trusts which promise to be of such deadly danger to the body politic. Not only from the Western, but from the Eastern, hemisphere, from the shores of the Caspian Sea at Baku, where the ever-burning pillars of fire were for many ages the unsuspected indices to the store, is produced the same material.

The heavy oil which remained after the lighter oil had evaporated or been distilled away was, for a considerable period, discarded as a waste product. I need scarcely draw your attention to the fact so well known to you of the utilisation of this product after proper purification, as it has been introduced into pharmacy under the name of "vaseline," and now not only this, but similar heavy petroleum bodies, are most extensively used by pharmacists. The solvent powers of light petroleum have been taken advantage of in the preparation of alkaloids, especially of quinine alkaloids, and the heavier liquid oils are now also in extensive demand as lubricants. Mineral shales in Scotland and in Eastern Europe and Western Asia have also been used to prepare the heavy paraffins and lubricating-oils, and the amount of paraffin used for candle-making is now in excess of the supply from the hard fats of the animal kingdom.

Acetylene, first discovered by E. Davy, and still further investigated by Berthelot, has risen into considerable popularity, especially on the Continent. It gives a very brilliant light, but, unfortunately, like coal-gas, yields a very large amount of soot. One chemist in my county has used it for some years, and finds it not only very cheap, but he says it gives very little trouble. That it is of considerable commercial importance may be gathered from the fact that Mr. Lewes has published a book of about a thousand pages upon acetylene alone.

I cannot trust myself to speak of the achievements of geologists during the century which have enabled geology to take its definite place amongst the inductive sciences. Although the word

Biology

was unknown at the beginning of the century, being first employed by Treviranus in 1802, and, indeed, did not come into general use till the century was well on its way, the two divisions of animate nature were, of course, differentiated long before our time. At the close of the eighteenth century the study of both branches was wrapped in the swaddling clothes of a narrow system of classification, and the real vital questions of both the animal and the vegetable kingdoms were obscured by a too close devotion to the library or the study, rather than to the open book of nature, which has a new truth on every page, and in which, pore as we may, there is still some secret to unravel.

At the beginning of the nineteenth century it was an article of faith to consider a species a fixed immutable entity, specially created, and as Linnæus in his "Fundamenta Botanica" says, "Species tot numeramus, quot diversæ formæ in principio sunt creatæ," and by the great majority of the civilised human race believed to have a strictly limited lineage. This opinion was but slightly modified, notwithstanding that Lamarck stated in his "Philosophie Zoologique" of 1809 that his belief was that species themselves are descended from preceding species, until another half-century passed by, when the researches of two eminent countrymen of our own opened the door for other and wider views. The first of these was Alfred Wallace, connected by marriage with the family of one of our own members, the veteran bryologist Mitten, of Hurstpierpoint, and the other the immortal Charles Darwin, who has elevated the theory of the evolution of species into a scientific canon, and whose work, the "Origin of Species," has vivified the dead bones of a narrow formalism, and led us to a more comprehensive study and a more elevated point of view of organic life which enables us to see that affinity means a closer relationship than mere similarity, and instead of being fortuitous is dependent in so many cases upon a common ancestry.

I cannot venture to weary you with many instances of the manner in which vexed zoological questions have been solved by the unwearied efforts of biologists since the advent of the nineteenth century, but two examples may suffice.

First, sheep-rot. This was known as a troublesome pest, causing great loss to the agriculturist, and was known to be produced by a worm called the "fluke." Farmers attributed the disease to various causes, among which were wet seasons, living in very wet pastures, or the presence of certain herbs in the fields, and one of these often found in wet marshy ground, *Hydrocotyle vulgaris*, was especially blamed. The cause was, however, clearly proved to be of a very different nature by a worker in the Museum Laboratory at Oxford, who by a brilliant series of researches was enabled to trace the life-history. He had been led to believe that the worm was one of those organisms which in one of its transitional stages passed a period of its life in another host, and probably in a snail. This he was enabled to prove, and it was found that snails feeding in pastures where there are sheep infested with fluke, in devouring herbage swallow some of the excreta of the sheep, in which great numbers of the fluke-ova abound, the egg in due time hatches, and the young larvæ encyst themselves in the snail. If a sheep accidentally swallows the small snail which lives on the herbage growing in wet places, the encysted worm in passing through the alimentary canal develops into an active stage, and, boring through the intestines, eventually finds its way into the liver, where it grows into the flat tadpole-like worm so well known and so much hated by the farmer.

The second instance is that of the common eel, which puzzled philosophers since the time of Aristotle till the year 1896, when it was the privilege of an Italian *savant*, Signor Grassi, to explain the extraordinary transitions through which it passes. Shortly stated, the facts are these. Eels living in our lakes and rivers follow a course exactly opposite to the salmon, which, as is well known, leave the sea for fresh-water streams in which to spawn, and one must see to realise the efforts these fish make to get over any obstacle that impedes their upward course. In our fresh-water streams neither spawning eels nor even mature eels are found. It was conjectured that they went seawards to deposit their ova, but who could have guessed the true facts, or can even now realise that wonderful power of instinct which is exhibited? It is true that the eels do go to the sea to spawn, but, not content with shallow water of our coasts, they go onwards and downwards till, in such deep waters as are found in the Mediterranean near the Straits of Messina, they find the bourn for which they have been in quest. A gradual but considerable change takes place in their appearance, which is to some extent rendered necessary in order to accommodate themselves to the pressure exerted by the weight of 250 fathoms of water. In the dark recesses of this comparatively unmolested breeding-place they spawn, and the large eggs float but do not rise in the water. From these eggs are hatched a young fish as unlike an eel as can well be imagined, for it is flat, transparent, colourless, tape-like, and devoid of red blood. These organisms had long been known, and have, in fact, been named *Leptocephali*, but the great ichthyologist, Günther, suggested they were abnormal larvæ incapable of further development, until Grassi found this not to be the case. The young eel, having completed its first stage of growth in the deep waters, ceases to feed, loses bulk, and secretes pigment on the surface of its body. With this change is co-ordinated the shedding of the larval teeth and the replacing of the larval skeleton. Then the fish begins to feed again, it gradually comes nearer to the surface, and when it is about a year old and 2 inches long it enters a mouth of a river, and is an elver or young eel.

For the division of biology which comprises the vegetable kingdom, with which we are the more interested from its being now a special subject in pharmaceutical education and examination, we use the term

Botany,

but the name certainly does not convey to the outside world an adequate idea of the huge and varied conglomerate of many sciences of which this many-faceted subject is really composed. At the beginning of the century Sir James E. Smith it is true divided it into eight sections, but so far as the systematic side was concerned the same restricted view was taken as that which characterised the study of the division of zoology. The progress of the century has resulted in the same development of our ideas as to the origin of the vegetable system. Notwithstanding the researches in palæophytology by Brogniart, Schimper, Solms-Laubach on the Continent, and in our own country by Lindley, Carruthers, Williamson, and our own examiner, Seward, there are many gaps which still remain unfilled, and no fossil plant has yet been discovered which cannot be classified into one of our known groups, although some new families have been found. On account of the more delicate and perishable character of plants their preservation has in many instances been very incomplete, or in still more instances has not been effected, so that it cannot be said that the ancestry and development of our existing flora has been definitely traced, yet on the whole it may be assumed that there has been an evolution of the higher from lower forms in the successive geological periods similar to that which has occurred in the animal kingdom. We see in Palæozoic periods the predominance of pteridophyta, in the Mesozoic the gymnospermous plants prevails, while in the Tertiary and Quaternary times the more highly developed angiosperms abound; but although there is some good reason to believe that the earliest plants were algæ, and these occur in the Cambrian formation, yet there are at present no gradual transitional forms known which show in what manner the vascular plants found in the Silurian or Devonian rocks have been developed from these or the siphonaceous algæ of the Palæozoic era.

For a full account of the history of the progress of botany in the nineteenth century I may direct your attention to the exhaustive Presidential address by Professor Vines to Section K at the Bradford meeting of the British Association last year, and some portion of which I have epitomised here. First, as to the increase in number of the known species of plants, in the synopsis of 1809 Persoon enumerated about 20,000 species of phanerogams; at the end of the century it will be found that they number about 105,000—a very astonishing increase. The pteridophyta now amount to about 3,500; the bryophyta to 7,650; while the fungi, in which are now grouped the bacteria, according to Saccardo's estimate, amount to nearly 40,000; the lichens to 5,600; and the algæ, including 6,000 diatoms, are stated by De Toni to number 14,000. These, added together, reach to the enormous number of nearly 176,000 species of living plants. Necessarily this immense total is partly accounted for by the great extent of freshly explored country opened up during our period; but we can also recognise here the enormously accelerated impetus in scientific investigation which has resulted in enlarging the number of known species of flowering plants by over five times the amount recorded a hundred years before. Again, the transference of bacteria, formerly thought to belong to the zoological section as infusorial animals, has very materially added to the number of species now classed in the vegetable kingdom, and it may be that a more complete study of the life-history of the tiny, but yet most active, agents will show that in many instances they are not specifically different, but are races, or mere modifications, owing to local conditions; yet Professor Saccardo believes that the total amount of existing species of fungi alone is as many as 200,000, and that the total number of species of plants in the world reaches to 400,000—a field sufficiently wide for the most ardent systematist to explore even during the present century. A few words must be given to

The Flora of the United Kingdom.

At the close of the century British botany was still under the influence of the Linnæan system. The closing years of the eighteenth century had been marked by the publication of three editions of Withering's "Natural Arrangement of British Plants"; but a more important work had also been commenced by the issue of Sowerby's "English Botany," the text of which was contributed by Sir James E. Smith, while the coloured drawings were from the pencil of James Sowerby. Although not so well executed as the figures of plants in Curtis's "Flora Londinensis," this was meant to do for the British Isles what that work did for a more limited area. Before the opening year of the nineteenth century eleven volumes, containing 522 plates, had appeared, and the work slowly progressed until the thirty-sixth and completing volume was published in 1814. Altogether 2,592 plates are figured, and included 1,445 phanerogams; but of these only about 1,190 are native species, and according to our present ideas 76 are varieties and 13 are hybrids. In addition 55 pteridophyta and 6 species of characeæ, of which one fern is not native, are included, 128 denizens and aliens are included, and 38 are either errors or plants of quite casual occurrence.

The remainder consists of 423 bryophtes and 663 algæ and lichens; 26 species of phanerogams were for the first time recorded as British plants. But this work was actually for the greater part preceded by Smith's "Flora Britannica," published in the years 1799–1804, which is written in Latin, and extends to 1,406 pages, and describes 1,360* species of flowering plants and vascular cryptogams, but of these 23 are erroneously reported as natives of Britain, and 6 are either errors of identification or are only of casual occurrence, which are not now admitted to our British lists. Fifty more are treated as full species, which, by botanical authorities of the present time, are either considered to be varieties or hybrids. Deducting these, we find about 1,260 plants which are now treated as species in the London catalogue were described in it. But there are also references to at least forty varieties which are now considered to be full species, so that the number of British species then enumerated, judged by the present standard, was about 1,300, as against upwards of 1,900 at the present time; but of these the segregation of the brambles and hawkweeds is answerable for over 180. It must, however, be borne in mind that many plants mentioned by the older authorities are not given in Smith's "Flora Britannica," but even with all these deductions we see that the nineteenth century witnesses a very considerable advance in the number of species known as occurring in the British Isles, and of these *Inula salicina*, *Erica mediterranea*, *E. Maekaii*, *Spiranthes Romanzoffiana*, *Habenaria intacta*, *Sisyrinchium angustifolium*, *Potamogeton Kirkii*, *Carex fusca*, *Rosa hibernica* (found in 1795 near Belfast, but now recognised as a hybrid of *R. canina* and *R. spinosissima*), *Pinguicula grandiflora*, *Saxifraga Geum* (but originally found, although not described, long previously) belong to the Irish flora.

In 1821 "The Natural Arrangement of British Plants" was published, being the work of S. F. Gray, greatly assisted by his son, John Edward Gray. As its name implies, this work discards the artificial arrangement of Linnæus, and shows the relations of plants to each other as already taught by Jussieu, De Candolle, and Robert Brown. In 1824 Sir James E. Smith published the two first volumes of "The English Flora," the concluding fourth volume appearing in 1828, and is a very valuable work. In 1830 Sir W. J. Hooker issued his "British Flora," which, like the last-named work of Smith, also followed the Linnæan arrangement. In 1843 Babington, in his "Manual of British Botany," adopted the natural system, which has since held sway, but also in another way departed from the stereotyped method which had for too long a period obtained, and from a careful examination of the plants in the field, and by comparison with continental specimens did much to do away with the reproach English botanists had laid themselves open to of being too insular. I need not further trace the progress of British botany except to add that in 1863 a third edition of "English Botany" was commenced under the editorship of Dr. Boswell Syme, and the excellent descriptions of the species given there are the best we possess, but the reprinted figures are not so well coloured as in the original, nor do they compare favourably with those in the great floras of Germany, Denmark, or Greece; the last named, containing the finest, most artistic, and most accurate of any floral drawings yet produced, were the work of the Austrian artist Ferdinand Bauer from plants collected by Dr. John Sibthorp, and the plants and original drawings are still preserved in the herbarium at Oxford, where he was professor of botany. Not only have these general floras of Britain been produced, including the excellent "Student's Flora of the British Islands," by Sir J. D. Hooker, which appeared in 1870, and the more compact "Handbook of the British Flora," written by George Bentham, issued in 1857, but the attention of British botanists has been also paid to smaller areas, and many excellent county floras have appeared, and of these Trimen and Dyer's "Flora of Middlesex" and Briggs's "Flora of Plymouth" set a very different standard from the mere lists of plants which had been characteristic of the preceding century. Now the floras of more than half of the English counties have been published.

We owe a great debt of gratitude to Mr. Hewett Cottrell Watson for his works on geographical botany, and to him we owe a large part of what is known of the distribution of plants through Britain. Fired by his example, Mr. D. Moore, of Glasnevin, and Mr. A. G. More, of Dublin, compiled the "Cybele Hibernica," of which a second edition, by N. Colgan and R. W. Scully, has recently appeared, and this does for Ireland what Watson's "Cybele Britannica" did so well for the British flora. The systematic study of the lower branches of the vegetable kingdom has also been assiduously carried out, and in 1845 Hassall published two volumes describing the freshwater algæ, and Harvey in the same year issued his "Phycologia Britannica." In 1857 my old friend the Rev. M. J. Berkeley published his classical "Introduction to Cyptogamic Botany," and during the next dozen years many new fungi, numbering in all nearly 6,000, were described by this eminent worker. In 1855 Wilson published his excellent "Bryologia Britannica," with accurate figures and descriptions of our British mosses; and in 1871 Leighton brought out the "Lichen Flora of the British Isles," while M. C. Cooke in the same year issued his "Handbook of the British Fungi." In 1860 Pritchard completed his "Infusoria," which included also desmids and diatoms. In 1880 Dr. Braithwaite commenced his comprehensive "British Moss Flora," which is still in progress, and this and the more modest "Manual" by Dixon and Jamieson testify to the zeal of British bryologists, by whose researches during the century the moss flora has been more than doubled.

In concluding this note of the systematic work of the period I must allude to the production of Bentham and Hooker's "Genera Plantarum," which was issued during the years 1862–83—a monumental work worthy of the highest honour, in which the Candollean classification is adopted; and another gigantic undertaking has been also completed in the "Index Kewensis" of 1895, which was compiled by Mr. Daydon Jackson, under the direction of Sir J. D. Hooker, which gives the names of all plants published from the time of Linnæus up to the end of 1885. Special monographs on various groups of British plants have been published, which have done much to assist those field botanists who are especially interested in critical genera. Among these we may single out that on the British Hieracea, which is being prepared by one of our own members, Mr. F. J. Hanbury (the worthy bearer of an honoured name), illustrated by very beautiful lithographed drawings; the excellent account of the Potamogetons of the British Isles, from the pen of Alfred Fryer; the works on the British Rubi, by Professor Babington, and more recently by the Rev. W. Moyle Rogers, which have increased the number of British fruticose Rubi by nearly a hundred species; and that on the *Characeæ*, by Messrs. Groves; while the willows have been described by Dr. Buchanan White in the pages of the Linnean Society's *Journal*, with the result that many of the plants considered to be good species by Sir James E. Smith and the salicologists of the early part of the century are now treated either as hybrids or varieties—an object-lesson, perhaps, for those botanists of our own time who have so laboriously increased the number of species of hawkweeds and brambles. The roses were also described by Mr. J. G. Baker in the same journal, but they now require a fresh monographer, since the work of the veteran Belgian botanist, M. Crépin, shows that a different view of specific limitations will considerably modify the arrangement in the immediate future. This opportunity may be taken of congratulating Mr. Baker, jun., who was originally a member of our craft, for the interesting work he is doing in the British flora, especially in the *Viola* group. Good work has also been done in the Algæ by our late President (Mr. E. M. Holmes), and in the fresh-water forms by Mr. West, and in the mosses—especially those of India, which have been very carefully studied and described—

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* See "British Botany in the Nineteenth Century," by W. A. Clarke in *Journ. Bot.* (1901), pages 128–140.

by the veteran botanist, Mr. Mitten, already alluded to; and these workers are all connected with our calling of pharmacy.

In another department, which he made especially his own, Daniel Hanbury delved in the storehouse of the past, and acquainted himself with the drug-markets of his day, in order, in conjunction with Professor Flückiger, to prepare the standard work, "Pharmacographia," which appeared in 1874, on a much too neglected subject. A very useful and praiseworthy work on "Medicinal Plants" was prepared by Professor Bentley and Dr. Trimen in 1880, which lifted a reproach from the shoulders of British botanical pharmacognosy.

To show that something has been done also in the delineation of new or interesting species of plants from a horticulturist's point of view, I may state that the three chief magazines devoted to this subject—namely, the *Botanical Magazine* (7,241), Hooker's *Icones* (2,675), and the *Botanical Register* (2,692)—have figured 12,614 plants during the century.

The Systems of Classification

have been modified by the discovery of the eminent botanist Robert Brown, in 1827, of the gymnospermous nature in the ovule in cycads and conifers, which has resulted in the separation of the former from the monocotyledons, and of the latter from the dicotyledons, and formation of them into a fresh sub-class, the gymnosperms, which are now looked upon as being a distinct group of archaic phanerogams.

Lichens, which were considered a distinct section of the vegetable kingdom, notwithstanding that Haller had a glimpse of the true state of things in the preceding century, have been proved to possess a dual nature, as it was reserved for Schwendener in 1869 to make a definite statement that a lichen consists of two distinct organisms, a fungus and an alga, living in symbiotic union, as De Bary had previously suggested, and this is the view now generally accepted. Symbiosis is an extraordinary condition which allows two distinct organisms to exist together, as Marshall Ward has happily said, "like a small limited-liability company," mutually assisting each other—but not, I think, with an unqualified directorate—and examples are also found in the animal kingdom. There are many interesting instances of symbiosis, especially the widely spread examples in which a mycorhiza is symbiotic with the rootlets of trees such as the *Cupuliferæ*, willows, pines, and others which grow in rich humus soils, as also many plants such as the heaths, many orchids, and gentians, and especially those in which there is a deficiency of root-hairs, and in these the hyphæ of a fungus act as the carrier of organic matter to the larger organism. This fact explains the dying out of many plants, such as heaths and orchids, and even conifers, when they are planted in soils deficient in humus, and consequently the absence of the mycorhiza, which in congenial circumstances breaks up the food and introduces it to the stronger plant, which in return gives something of its strength, as well as affords a lodgment, to its more lowly companion—a property quite different from that direct robbery of nutrition from a host by a mere parasite such as the dodder or broom-rape. But there are instances of a more malignant symbiosis when two organisms—for instance, a bacillus (*B. oleæ*) and the hyphæ of a fungus (*Chætophoma*)—set up a disease in a tree, such as the olive, on which they subsist, and to which they do great mischief; and it may be that one of the most deadly scourges of mankind—sarcinoma—is of this character.

It was reserved for De Saussure to demonstrate, in 1804, that plants derive by no means an inconsiderable portion of their food from the soil, but it was not until 1860 that the researches of Boussingault, and of Lawes and Gilbert, showed that plants do not absorb free nitrogen from the air by means of the leaves, as Priestley and Ingen-Houz in the preceding century had contended. It is true that plants do absorb nitrogen, but this is not done by the leaves, but through the agency of bacteria in the soil, or, as in the case of the *Leguminosæ*, actually in symbiotic union in tiny root-nodules of the plant itself. This curious property is of great economic value, as it explains how an impoverished soil, poor in nitrogen, may be made to accumulate it by growing lupines, lucernes, sainfoin, or vetches on it, as has been pointed out by Schulz-Lupitz; and commercial advantage of this discovery has been taken by pure cultures of the bacteria being offered for sale, in order that the seeds or soil may be infected with the organism.

With regard to the process of fermentation, the word as employed by the writers of the nineteenth century meant a process of brewing of beer, or the making of wines and spirits, and was supposed to be essentially a chemical action, notwithstanding the fact that Leeuwenhoeck, of Delft, discovered the globules of yeast in fermenting wort nearly two hundred years ago; while La Tour and Schwann and Kuetzinz, in 1840, showed that these globules were budding plants, living on the sugar of the liquor, and should be classed among the fungi. This discovery of the nature and use of yeast led the way to further investigations, and while Rees, in 1870, gave the name *Saccharomycetes* to the fungus, he also showed that several species exist; and in 1883 a Dane (Hansen) found by special culture of a single spore it was possible to obtain a constant type of pure yeast, with its own peculiar property—a discovery which has been of immense importance to the brewer, who is now enabled to minimise the loss which was formerly caused by beer souring or becoming thick from after-fermentation, and which in certain seasons, or with bad yeasts, came back from the retailers in large quantities. But it has been more recently contended that yeast itself contains an enzyme, named "zymase," which has been extracted from it, and that this ferment is actually the cause of the fermentive action. I need scarcely here draw attention to Professor Green's excellent work on these plant-ferments.

Diastase is another ferment of immense importance, belonging to the class of unorganised enzymes, which was made known by Payen and Persoz in 1833, who extracted it from malt; and they found this principle was capable of converting the starch of grain into sugar—that is, the reduction of the more complex carbohydrates into others of simpler form—and I need scarcely remind you of what commercial importance, from a pharmaceutical point of view, the preparation of malt-extract has become, which depends for its value upon the percentage of diastase it contains. The diastatic power of *Aspergillus*, one of the mould fungi, is utilised in the preparation of Indian soy from the soja-bean, and a patented process for obtaining diastase from *Aspergillus* exists. There are many others, such as cytase, glucase, inulase; and there are other enzymes which decompose glucosides, such as emulsin, myrosin, &c. There are some also, such as the trypsins, which act on proteids; while others—lipases—change fatty matters, and another class, the oxidases, change organic substances; and familiar examples exist, such as the brown colour produced in apples which have been bruised and the blue colour shown when *Boletus luridus* is cut; and it is not unlikely that the blackening of certain plants during the process of drying, such as the cow-wheats and certain bedstraws, may be owing to the presence of an oxidase enzyme.

To an Alsatian, De Bary, we owe the foundation of modern mycology, and his brilliant discovery of heterœcism marks an epoch in our knowledge of the wonderful ways in which Nature works in order that an individual organism can be perpetuated. One of the most vexed questions which puzzled the fungologist was the life-history of the wheat-rust—a parasite which is alluded to in the Book of Genesis, and which, from its destructive action on our cereal crops, is of vast agricultural importance. The disease, as you know, was formerly considered to be caused by the wheat-rust (*Puccinia graminis*); but many people, especially farmers, believed that the presence of the barberry-plant, on which occurs a fungus known as *Æcidium berberidis*, seemed to have some relationship to the presence of wheat-rust, and as early as 1660 a law existed at Rouen which ordered the destruction of barberry-bushes. The eminent fungologist Fries held strong views as to the specific, and even generic, differences between the barberry *Æcidium* and the wheat *Puccinia*, which necessarily gathered great weight; but De Bary, in 1860–64, proved that the æcidia of certain other forms are only stages in the life-history of species of *Uromyces* and *Puccina*. In 1864 he actually proved by sowing the teleutospores of wheat-rust on barberry-leaves that this was actually the fact, and he for the first time saw the entrance of the infecting-tube and the beginning of its growth in the tissues of *Berberis*. In 1865 he demonstrated the infection of the corn by means of the æcidiospores from the barberry; this fact, startling as it is, is now found to be of very general occurrence in leaf-fungi, and that most of the fungi formerly known as distinct species of *Æcidium* and *Puccinia* are really only two stages in the life-history of an individual species – a condition of things which the larval and image condition of insects might have prepared us for. But to De Bary, as I have said, is due the discovery of heterœcism, which suggested looking at the vegetable kingdom from a new standpoint, and which has assisted to clear up many mysteries.

Another valuable truth which has been made known is that which shows that sexuality in plants, which for long ages was known to be the privilege of the phanerogams, was proved by Hofmeister in 1851 to be a feature also possessed by all classes of cryptogams, and that therefore a quality thought to belong to flowering plants only is also owned by the more lowly unflowering forms—in fact, another proof of the unity of Nature has been established, and we see the higher phanerogams and the lower cryptogams are not separated by any impassable abyss, but, on the contrary, that the chasm is bridged over by many connecting links. To Hofmeister is also owing the discovery of the alternation of generations in the higher plants; while Strassburger, in 1876, first observed the actual process of fertilisation. Mohl described the nitrogenous lining of the cell-wall to which he in 1846 gave the name protoplasm, that most complex and all-pervading and mysterious substance which Cohn, the veteran founder of bacteriology, in 1850 identified with the animal substance previously described by Dujardin under the name "sarcode," and thus forged another link which joins the animal and the vegetable world.

One marked change has taken place during the past century so far as

The Professorial Teaching of Botany

is concerned, for in the early years of the century all the important botanical chairs in Britain were held by systematists, now not a single one is so occupied. This is not an unalloyed advantage. That systematic botany alone should be taught to the almost absolute neglect of histology or physiology was doubtless an evil, and it has been said that taxonomic teaching was choked by its own nomenclature; but the whirligig of time brings its revenges, and now at the close of the century we may without injustice retort that laboratory botany is being strangled by the exuberance of its terminology.

And the positive evil exists that with the neglect of systematic teaching in Britain our continental and trans-atlantic *confrères* are occupying the ground in which Britain for long held a foremost position, and which from the extent of our colonial possessions should be especially its own. To the pharmaceutical student the advantage of studying morphology rather than physiology is manifest, and even so far as histology is concerned the examples chosen should as far as possible be such as are connected with pharmacy.

Bacteriology

is the study of schizomycetes, as Naegeli called the plants we now know by the name bacteria. These were first discovered by Leeuenhoek 200 years ago, and were for a long time considered to be infusorial animals, until Cohn, in 1853, pointed out that they were of vegetable origin, closely allied to fungi. Their importance was made manifest when Pasteur, in 1862, showed that certain bacteria are employed in converting urea into ammonium carbonate, and more recently Winegradsky, in a brilliant series of experimental researches, discovered that other species oxidise the ammonia compounds into nitrites, while still other species change the nitrites into nitrates. Thus an obscure cycle in Nature has been clearly elucidated, and we are enabled to realise how the immense natural deposits of "caliche," or impure nitrate of soda, which are found in a rainless tract of country in the plain of Tamarugal, between the Andes and the coast-line of Northern Chili, have been gradually formed by the action of these minute organisms, which have converted the accumulated nitrogen of the soil into these valuable deposits, which are so enormous that as much as 1,200,000 tons was exported in a single year in order to replenish the exhausted soils of another hemisphere. But it is the part which bacteria play in the causation of disease which especially interests us as pharmacists, and time fails to tell of all the triumphs of scientific work in this great subject since Pasteur, Lister, and Koch, each in a separate department of correlated inquiry, deduced important principles of treatment, which have altered, and will still further alter, our daily task as dispensers of medicine.

Now I have wearied you with a sketchy account of a few of the more notable features in the progress of science during the century, you may well demand of me, What on earth has this to do with pharmacy?

My answer is, I have heard so many speeches made, so many addresses delivered, and read so many columns about the decadence of pharmacy, and have been so wearied with reading clauses of Pharmacy Bills which perish before they are born, that I ventured to divert attention from introspective analysis, and took the liberty of detailing some of the advances made in the higher branches of scientific inquiry. To come to those

Matters more Intimately Connected with our Calling,

let us ask, and frankly try to answer, three questions: Is there a decadence in pharmacy? If so, what are the contributing causes? Is there a remedy? It is difficult to know what was the actual condition of pharmacy at the beginning of the century, but from the information one is able to obtain about that time, there is good reason to believe that a chemist and druggist carried on a protean-sided business, prescribing freely for many of the diseases to which flesh is heir, and for some of those which flesh acquires, acting as a dental practitioner, dealing in paints and colours, selling veterinary preparations, and, on the whole, making a good living. In one town which I take as an example there were as many pharmacists who were making individually as large profits when the town had twenty thousand inhabitants as is done now when it has eighty thousand. The pharmacists of that period certainly occupied relatively a better position among their fellow tradesmen than the present ones are doing. In fact, we may say that, as compared with the 'sixties and 'seventies, the depreciation in goodwill alone among British pharmacies is at least 50 per cent. So much for the trading point of view. Doubtless, as compared with the beginning of the century, the pharmacist of to-day is a much better educated individual, and, in this respect, I am willing to concede that, as compared with his fellow tradesmen, he has not retrograded, but his income has not kept pace with theirs. If we compare the present time with the 'seventies and 'eighties, I think we must admit that the general interest in science exhibited by pharmacists shows a decided falling-off. The regrettable loss of numbers experienced by this Conference corroborates this statement. I am not disputing that excellent work is done by followers of pharmacy to-day, but I am afraid it is chiefly done by those engaged in wholesale rather than retail pharmacy.

I answer my first question by asking another: Must we not sorrowfully admit that retail pharmacy is less prosperous now than at any time within memory? To the second question as to the cause, many exist. First, there are those which are beyond our control, such as the diminution of returns, owing to the segregation of businesses and professions. The working classes, who came to the druggist during the first half of the century for advice and medicines, now to a great extent belong to provident dispensaries, many of which are very excellent institutions; but others, greatly assisted by charitable doles, are simply close corporations for a few favoured medical men; others are notoriously abused in admitting as members individuals who are perfectly well able to pay both for medical attendance and for medicine. A very considerable share of business has thus been diverted from pharmacy. Nursing and convalescent homes and other pseudo-charitable institutions also contribute to this. The excellent socialistic work done by municipalities and parish councils in providing proper sanitation, in the preventive treatment of disease, in the isolation of infectious diseases, are all factors exerting adverse influence, although we cannot grumble at them because the body politic has greatly benefited. There are, however,

Contributing Causes which are Less Legitimate.

Practically the first half of the century saw free trade in medicines and poisons. It is true the Pharmaceutical

Society of Great Britain had been established, and those members of our business who had made their way, and who were not only good business men, but also men with a respect for and lovers of scientific pursuits, established a voluntary system of examination which was useful and practical, and one in which science *per se* was the servant and not the master, and in which a knowledge of pharmacy as a business was the first requisite. In the course of time the diploma became a valued possession, not only from what it meant in a scientific point of view, but also as being a distinct commercial asset. It was then frequently seen in shop-windows. The success of the examination was recognised by our Legislature, since it passed the Bill which gave the Pharmaceutical Society power to examine and make that examination compulsory. What has been the result? A gradual divergence towards the purely scientific side in the examinations, in which the more practical part of pharmacy has been pushed to the wall. Concurrently with this has been the passing of large numbers of candidates, who appear to be so disgusted with the modicum of science which they assimilated for the purpose of passing the examination, that they forthwith drop all pretension to the name of scientists, and prefer to exist by selling their birthright as independent men, to be a qualifying dummy, ruled over by people who know nothing, or next to nothing, of pharmacy, yet can give the qualified man points in everything relating to business transactions—a symbiotic union, in which both organisms do little good to themselves, and infinite harm to us. Therefore, I think our examination-system and our teaching may have unconsciously assisted in the downward movement. There has also gradually grown up in certain quarters a kind of scorn for knowledge of business routine, and an undue glorification of the scientific side. Instead of the form of education so ably sketched out by Mr. Schacht in this place twenty-three years ago, it is now seriously suggested that the proper method of educating a pharmacist, is to send him to college, where having attended a certain number of compulsory lectures on botany and chemistry, he would be able quite easily to pick up sufficient practical pharmacy to qualify. This being attained he would be soon able to acquire a business knowledge of pharmacy. Gentlemen, I think this is a disastrous suggestion. It might possibly answer in a state-protected system of pharmacy, but I venture to think that such a plan could not succeed where the state has done much to hinder, but nothing to protect the interests of pharmacy. In the struggle for existence how could such an one successfully compete with another trained as a draper's apprentice, for instance, in the business routine, or as a pharmacist's apprentice should be, in all the practical groundwork of his trade. Now I come to another great cause in pharmaceutical decadence—namely, the growth in the

Sale of So-called Patent Medicines,

as well as those still more insidious and dangerous foes the proprietary articles used so often, alas! ordered, in dispensing. The first were in former days sold by stationers and newspaper-agents, an arrangement brought about in many cases by the advertising-agents taking the cost of advertising in kind, then impressed with their growth, chemists unwisely made themselves the advertising-medium; but the benefit was ephemeral, as on the cutting-element being introduced, patent medicines offered an opportunity which was quickly grasped; but, after all, these were open enemies, the greatest foes are those of one's own household, such as the proprietary article with which our physicians are profusely sampled, and which makes dispensing, which at one time was both pleasant and profitable, neither agreeable or remunerative. Once pleasant, because not unseldom the prescription necessitated some call upon the intellectual faculty and one's chemical or pharmaceutical training proved of service; now, when two pills No. 4 (Brown & Jones) are ordered, with some one else's mist. bismuthi and another person's liniment, a natural feeling of injury is experienced by the pharmacist, who having expended a considerable amount of time and money in being educated to prepare such medicaments, feels that the physician is tacitly telling him he has little confidence in his knowledge. The sending out in the original packages such medicines as I have alluded to hardly comes under the head of intelligent compounding, while pecuniarily, instead of a profit an actual loss is not unfrequently incurred. But all these causes are relatively unimportant compared with the effects produced by company-trading upon pharmacy, associated as that is with the robbery of our titles and the suggestive inaction of the Legislature to give us proper protection by proper legislation. The Legislature called us into being and insisted that every chemist before commencing business should be qualified, and then out-gilberted Gilbert by allowing seven people, not one of them qualified, to open a chemist's business and call themselves chemists. Contrast this behaviour with that adopted by any other civilised Government on the Continent or elsewhere. Compare it with Germany, our most powerful rival in applied chemistry, and there we shall find a very complete protection is given to the pharmacist, and an even more generous treatment is offered in Russia, but from one reason or another—possibly from the bugbear of "departing from the principles of free trade," or, perhaps, a too jealous care of vested interests which have been built up on a piratical basis—the law-making assemblies of this country stand by and see a gigantic injustice done to a body of men, which it is their duty to see receive a just protection.

Is There a Remedy

for the bad times we are enduring? Something can be done by the Legislature, and that something should be asked for with no faltering voice, with no divided counsels, with no uncertain sound, and with no unnecessary delay. But the greater part of the problem must be left to ourselves. The battle is to be won by pitting our own exertions and our individual industry against the advantages of large capital, of great purchasing powers, and other premiums which companies possess. We shall have to rely upon ourselves—upon the fact that when a man works for himself he works for a hard taskmaster, who is satisfied with no slackness of effort, but one who demands the fullest employment of every faculty—and if this be given, the competition of a hydra-headed company should not be a too successful rival. The history of limited-liability companies in Britain during the past twenty years should offer some consolation, notwithstanding the enormous amount of capital which has been invested in them, for if the price at which they were floated is put against that at which they stand to-day, it will be found there is a very great diminution, even without taking into account the large number of those which, unhonoured and unsung, have melted into thin air.

In Ireland there is a brighter outlook, since to a considerable extent you have wrought out your own salvation; it remains for us to see that the members of this Conference which has done so much to foster the interests and the highest aims of scientific pharmacy—this Conference which has been and is the means of forming pleasant friendships, or of cementing and preserving old ones, and which has always advocated a high standard of mental discipline—should in no way fall short of the ideal sketched out in this city twenty-three years ago, but that not only the Conference in its corporate capacity, but each member of it individually, shall, with whatever talent he may have been blessed or with any faculty he may have acquired, strive to the utmost to defend the gage which he threw down when he entered the service, hard and unrequiting though it be, but a service which is no ignoble one, that of our common mistress—Pharmacy.

Vote of Thanks to the President.

Mr. N. H. Martin (Newcastle-on-Tyne), after the applause had subsided, rose to propose that the best thanks of the members of the Conference and of pharmacists throughout the world be given to Mr. Druce for his very learned, comprehensive, and interesting address. (Applause.) With it ringing in their ears he had only to suggest that Mr. Druce was himself a living contradiction of that which he suggested—that there is something in pharmacy which tends to limit the mental horizon of the pharmacist. (Hear, hear.) He did not think that any predecessor of Mr. Druce had had the opportunity of doing what he had done to-day, and no man of their acquaintance could have dealt with that subject of science in that masterly manner which he had done. (Applause.) It had been his (the speaker's) good fortune to listen to two eminent men within the past eight days deliver addresses on scientific subjects, both of whom commenced their lives as pharmacists, and are still pharmacists—he referred to Mr. J. W. Swan, President of the Society of Chemical Industry, and Mr. Druce—and nothing more comprehensive, more thorough, and of such consummate knowledge had he ever met with on the subjects dealt with than by these two pharmacists. (Loud applause.) He thought there was that in pharmacy which on a boy from school going into the shop, if he had a fair amount of curiosity, would provoke him to develop very highly his mental character. They had certainly in Mr. Druce one who was not only intimately acquainted with all the sciences with which the pharmacist's calling is associated, but who was capable of giving a *résumé* of other sciences. (Applause.) They knew how he had contributed to the knowledge of British county botanies, and he was sure they would join with him and pharmacists throughout the world, who would read the address they had heard, in according the President their deepest and most grateful thanks for the labour he had given, and the ability which he had devoted to the address. (Loud applause.)

Mr. R. A. **Robinson** (London) seconded the vote of thanks. He thought it was a very fortunate accident that Mr. Clarke had forestalled Mr. Druce in publishing his review on botany. It was due to that fact that they had an address of such surprising interest and covering such a wide view as they had just listened to from their President. Mr. Druce was an M.A. of Oxford through merit, a Fellow of the Linnæan Society, and he had served the office of Sheriff, and was now the Mayor of Oxford. (Loud app'ause.) They would agree that he was to be very heartily congratulated on the attainments which he had achieved. (Applause.) The President had a unique opportunity which was very much to their advantage. He had very great pleasure in seconding the cordial vote of thanks which had been proposed. (Loud applause)

Dr. **Attfield**, speaking as one of the oldest past-Presidents, supported the vote of thanks, and put it to the meeting. He had listened to many presidential addresses, but he thought none more interesting than that which reviews the past year or the past decade. Their President had given them a review of what was interesting to pharmacists and the advancements that have been made during the past century—(loud applause)—and nothing could be more interesting to pharmacists, inasmuch as pharmacy is founded on several sciences.

The resolution was then put to the meeting, and carried amid prolonged applause.

The **President**, in returning thanks, said he had been at some disadvantage, for the reason he had mentioned, in having suddenly to change the purport of his address. He had not in his remarks attempted to give a complete list of the officers of the Conference who had passed away, or who were not present; but he would like to say how very delighted they all were to see Dr. Attfield, the Secretary of the Conference in Dublin twenty-three years ago, present with them. He had done a very great deal to link together pharmacy and chemistry. (Applause.)

Visitors.

The **President**, again rising, said they were very pleased to welcome at the Conference Mr. C. F. Baker, of Calcutta, Mr. T. Ingram, of Johannesburg, and Mr. W. Moore, of Assam, and if those gentlemen would kindly say a few words they would be pleased. (Applause.)

Mr. Baker and Mr. Ingram rose simultaneously, but the former gave way, and Mr. **Ingram** thanked the members for the reception given to colonial representatives. It was the first time he had attended the Conference, and it had given him very great pleasure to be present. They had had a very exciting and difficult time in South Africa during the past two years, but they had stood by one another, and he was very glad to say they had been able to fully rely on the friendship they had for one another as pharmacists during a very troublous period.

Mr. **Baker** also thanked the Conference very heartily for the good wishes towards them expressed by the President. It was the first Conference he had attended—he hoped it would not be the last. There were not a very large body of chemists in India, but they had not to contend with the Poisons Act, he was glad to say. (Laughter and applause.) It had afforded him great pleasure to be present to hear the President's address, and he thought it was worth coming all the way from Calcutta to hear. (Loud applause.)

Letters of Apology.

Mr. **Naylor** said that letters had been received from the following gentlemen, who, being unable to be present, had all expressed hearty good wishes for the Conference:—Messrs. S. R. Atkins (Salisbury), Gowen Cross (Shrewsbury), John Moss (London), E. M. Holmes (London), Leo Atkinson (London), Farr (Uckfield), W. Martindale (London), Peter Boa (Edinburgh), Wright (Buxton), Wippell Gadd (Exeter), Collier (London), and Louis Siebold, who sent a message from his sick bed.

The **President** also read a letter of apology from Mr. G. T. W. Newsholme (President of the Pharmaceutical Society of Great Britain). Mr. Branson (of Leeds) and many other gentlemen had also written expressing their regrets at not being present. (Applause.)

Mr. **Naylor** then read a list of

Delegates from Kindred Bodies,

which included the following :—

Pharmaceutical Society of Great Britain.—The President, Vice-President, and Messrs. Cooper, Cross, Glyn-Jones, Harrington, Park, Symes, and the Secretary.

Pharmaceutical Society of Great Britain (North British Branch).—Mr. Peter Boa (Chairman), Mr. W. Doig (Vice-Chairman), and Messrs. W. B. Cowie, W. L. Currie, J. Johnston, C. Kerr, T. Maben, R. McAdam, A. Spence.

Pharmaceutical Society of Ireland.—The President, Vice-President, and Treasurer, and Professor Tichborne, and Messrs. P. Kelly, W. F. Wells, and R. Simpson.

Chemists' and Druggists' Society of Ireland.—Messrs. W. J. Gibson, W. J. Rankin, and John Watson.

Bristol Pharmaceutical Association.—Messrs. T. Buxton and J. Chandler.

Cambridge Pharmaceutical Association.—Mr. E. S. Peck, M.A.

Edinburgh Chemists' Assistants' Association.—Messrs. W. B. Cowie, W. Duncan, and J. Rutherford Hill.

Forfarshire and District Chemists' Association.—Messrs. A. Naysmith, A. B. Anderson, J. Anderson, J. Russell, W. Ramsay, Chas. Kerr, and W. Cummings.

Liverpool Chemists' Association.—Messrs. J. Alexander, J. Bain, Cowley, E. Evans, jun., J. H. Evans, Prosper H. Marsden, J. J. Smith, J. H. Swinton, and T. H. Wardleworth.

Chemists' Assistants' Association (London). — Messrs. W. Garsed and E. J. Strother.

Western Chemists' Association (London). — Messrs. Bowen, Harrington, J. H. Mathews, and W. P. Robinson.

Manchester Pharmaceutical Association.—Messrs. Johnstone, Kemp, Kirkby, and Pidd.

Newcastle-on-Tyne Chemists' Association. — Messrs. Chas. Ridley (President), Clague, Foggin, Gilderdale, Merson, Pescod, and Rose.

Nottingham Chemists' Association.—Mr. A. Russell Bennet.

Oxford Chemists' Association.—Messrs. G. C. Druce, M.A., and H. Mathews.

Plymouth District Chemists' Association. — Messrs. Barge, Hunt, Maitland, Nursan, and Park.

Sheffield Pharmaceutical and Chemical Society.—Messrs. A. R. Fox, G. T. W. Newsholme, and G. Squire.

Swansea Chemists' Association.—Messrs. J. T. Davies and J. Hughes.

Tunbridge Wells.—Mr. A. E. Hobbs.

Glasgow and West of Scotland Pharmaceutical Association.—Messrs. W. L. Currie, J. McMillan, J. Foster, G. Robertson, R. Brodie, P. McMurray, and Thos. Maben.

Midland Pharmaceutical Association.—Messrs. J. Poole, F. J. Gibson, and Chas. Thompson.

Wolverhampton Chemists' Association.—Mr. F. J. Gibson.

Bradford and District Association.—Messrs. R. W. Silson and Harrison.

Wigan Chemists' Association.—Mr. Phillips.

Exeter Chemists' Association.—Messrs. J. Hinton Lake, Henry Gadd, and H. J. Vinden.

Mr. **John C. Umney** (Hon. Treasurer) next submitted the

Financial Statement.

This showed that during the year the net income (apart from the Bell and Hill's fund 28*l.* 11*s.* 9*d.*) was 530*l.* 6*s.* 2*d.*, and the expenditure 530*l.* 6*s.* 2*d.* The following are the principal items on each side:—

Receipts.	£	s.	d.	*Expenditure.*	£	s.	d.
Members' subscriptions	406	2	4	*Year-book*... ...	406	2	9
Year-book sales and advertisements	76	16	6	Formulary ...	10	11	11
Formulary sales ...	47	7	4	Assistant Secretary's salary and rent	55	0	0

The liabilities of last year had been reduced from 171*l.* 19*s.* 8*d.* to 137*l.* 11*s.* 6*d.*

The Bell and Hills fund received 9*l.* 8*s.* 4*d.* as a dividend on a year's Consols, but there was no expenditure. The statement was attested by Mr. John H. Mathews (London) and Mr. G. H. Grindley (Dublin) as auditors. The Research fund, just instituted, stands at 47*l.* 5*s.*

Mr. Umney made a running commentary upon his report, stating, for example, that the past year's income from subscriptions was greater by 36*l* than any during the past few years, and the adverse balance had been reduced to 20*l.*, while about 15*l.* had been received since the accounts were made up. He also called attention to the fact that there will also be a saving in publication of the *Year-book* and in the Editor's salary, so that next year the Conference would be in a much better position than it has been for a long time, and quite out of debt, an announcement which was received with hearty applause.

Mr. Francis Ransom then read the following

Report of the Executive Committee.

The present report covers the thirty-eighth year of the existence of the Conference, and while the general meetings continue to be most successful both in attendance and interest, your committee regrets that the effective membership is still a source of anxiety. The number of new members elected during the past year has been 57, while the removals by death have amounted to 16, the resignations to 45, and 14 names have been removed owing to subscriptions being four years in arrear. Special efforts have been made during the year to prevent this lapse of membership, the senior Hon. Secretary having addressed a personal letter to each member whose subscription was in arrear. The result has been satisfactory in so far as the deletions have been 80 less than last year, but owing to the smaller number of elections the total membership is not greater than a year ago.

The Research List has been revised by a sub-committee appointed by the Executive, and by the courtesy of the respective Editors has again been published in full in the principal journals connected with pharmacy in this country. By the kindness of Dr. Attfield several subjects were introduced into the List which had been suggested by him as suitable for investigation in his Pharmacopœia Report for 1898.

It is with the profoundest regret that your committee has to record the resignation on account of ill-health of Mr. Louis Siebold, F.I.C., F.C.S., as Editor of the *Year-book*, a position he has filled with the greatest advantage to the Conference for the unprecedented period of twenty-seven years.

In accepting his enforced resignation, your committee placed on record its sense of the great ability, unflagging zeal, and wise discretion with which he has discharged his onerous duties, tendered to him its warmest thanks for his valuable services, and expressed its sympathy with him in his affliction.

Mr. J. O. Braithwaite has been appointed Editor of the *Year-book* for the current year, and he reports that the manuscript of Parts 1 to 3 are in a forward state, and will be in the hands of the printers next week.

Reference was made in the last report to a proposal to create a fund for the maintenance of a Research worker. There were found to be difficulties in carrying out the suggestion as originally intended; but a special fund, amounting to forty-five guineas for the present year, has now been raised, which is available for grants in aid of research. Gentlemen desiring to avail themselves of this fund are invited to apply to the Executive Committee. The Treasurer has opened a separate account at the bank under the title of the British Pharmaceutical Conference Research Fund, and it is hoped that the capital sum will be further increased by donations from time to time from other members who approve its object and desire its success.

A new edition of the B.P.C. Formulary has been prepared since the last annual meeting, and a report will be presented by Mr. Martin, the Chairman of the Committee. With deep regret your Committee has learnt from Mr. W. A. H. Naylor, the senior Hon. Secretary, that, owing to indifferent health and increasing claims of business, he is unwilling to be nominated again for the post he has occupied with such conspicuous ability during the past fifteen years. The extreme value of the services rendered to the Conference by Mr. Naylor during this period can only be fully appreciated by those who have worked with him on the Executive, but the serious loss to the Conference involved in the resignation of so able an official will be apparent to all members.

The death-roll includes the names of two distinguished honorary members of the Conference, Dr. E. R. Squibb, of Brooklyn, whose scientific researches had long ago placed him in the front rank of pharmacy, and Dr. Rice, of New York, the able Chairman of the Committee of Revision of the United States Pharmacopœia.

Sir Thomas Robinson was called upon to move the adoption of the reports, which he said were satisfactory in every respect, and he trusted they would have an opportunity of increasing the number of members of the Conference, especially in Ireland, whose pharmacy was very much more advanced than it was twenty-three years ago, and he felt sure that, from the members present that day and the interesting views they had heard put forward, the result of the present Conference would mean a large accession of members to the British Pharmaceutical Conference. (Applause.) He had spoken a good deal to those who attended the Conferences, and as he had now tasted how good they were, he thought he might safely prophesy that the Conference would in the future enjoy increased support. (Applause.) He was sorry to learn that Mr. Naylor was about to retire from the position he had held for many years. (Hear, hear.) He (Sir Thomas) only knew Mr. Naylor by repute, but he felt sure he was only expressing the unanimous wish of that Conference in asking Mr. Naylor to reconsider his determination of retiring, and to remain with the Conference. (Applause.) Sir Thomas Robinson concluded by moving the adoption of the financial report and the report of the Executive Committee. (Applause.)

Mr. Edward Evans, jun., seconded the motion. He said that while this was not the first time he had been present at a Conference, he thought it was the first time he had had a chance of speaking at one of its meetings. He need hardly say that he joined Sir Thomas Robinson in hoping that the change of secretaries was not going to really take place. (Hear, hear.) Anyone who was in the habit of attending the Conferences and listening to the discussions knew the sort of work that was done, and how necessary it was that a change of secretaries should take place as seldom as possible, especially if the work was to be well done. (Applause.) He (Mr. Evans) was quite sure that that Conference would go on to greater success than before because that day the members had heard one of the most practical and most interesting addresses that had ever been delivered at their Conferences. (Applause.) It showed how the President could blend scientific knowledge with business ability. (Hear, hear.) He (Mr. Evans) did not know very much about the scientific portion of the President's address, but, even at his time of life, so interesting was it that he might be inclined to take up the study of it. (Hear, hear.) With regard to the commercial part of the address, they were all interested in it, and they ought to take it very much to heart. (Hear, hear.) He believed that a great deal of good would come out of that Conference. It was with the greatest pleasure he seconded the motion proposed by Sir Thomas Robinson.

The President then put the motion to the Conference, and declared it carried.

The next piece of business was virtually the beginning of the scientific part of the proceedings, which was put to the meeting by Mr. N. H. Martin, Chairman of the Formulary Committee, who submitted the following report on

The B.P.C. Formulary.

Since the last annual meeting of the Conference the Formulary Committee has, with the consent of the Executive, published the Formulary, which it was anticipated would be ready towards the close of last year. Owing to various circumstances, but chiefly to the desire of every member of the committee to thoroughly test each formula, the publication was delayed until March of the present year, when it was issued in the form which the committee hopes is familiar to all the members. The additions and alterations are all set forth in the preface to the book. The present edition of the Formulary has been received on all sides with such favourable criticism that it would seem to indicate that it supplies an actual want in pharmacy. If it is the pleasure of the Conference to reappoint the committee, there is much work to be done to make the Formulary as complete as was contemplated when the committee was first appointed. The committee will be glad if all members of the Conference will interest themselves towards this end by indicating to the Secretary any shortcomings they may have observed in the present edition, and especially if they will send in the names of all preparations which may occur frequently in prescriptions, but for which there is at present no authorised formula in the Pharmacopœia or the Formulary. It is only by such assistance from all the members of the Conference that the Formulary Committee will be able to attain its maximum of usefulness.

July 20, 1901.

Next the President called upon the Treasurer of the Conference to read this paper:—

Pharmacopœial Requirements for Jalap.

By John C. Umney, F.C.S.

In the introductory part of this paper (which dealt with the present supply), the author referred to some of the recorded yields of resin in earlier days—*e.g.*, by Charles Umney (21·5 per cent), and Widenmann (22 per cent.). In 1893 C. E. Robinson examined ten samples which varied between 7·5 and 17·7 per cent. (average 12 per cent.), Cripps also examined thirty-four samples which varied from 5·8 to 15·6 per cent., averaging 9·8 per cent. The samples examined by Robinson were from retail pharmacies, and not from wholesale druggists, who, in the exercise of their judgment, had doubtless rejected many samples of the drug having a low assay of resin. The Pharmacopœia standards are:—B.P. 1885, 10 per cent., and 1896, 9 to 11 per cent.; U.S.P. 1880 and 1890, 12 per cent.; G.P. 1890, 7 per cent., and 1900, 9 per cent.; French Codex 1884, 16 to 18 per cent.

Dr. Attfield said in his Pharmacopœia report for 1888 "the proportion of resin yielded by jalap has for the past twenty years been gradually diminishing." Certainly during the last few months it has been extremely difficult to find any jalap on the London market containing a proportion of resin up to the minimum of the British Pharmacopœia, so the author has collected and examined samples representing the bulk in trade in this country, and has made inquiries, all with the object of seeing why the drug is so weak now. Flückiger (*Year-book*, 1890, page 146) has suggested that the resin is partially extracted from the jalap tubers in Mexico. One of the oldest drug-brokers in London, who has handled jalap very largely for the last half century or more, informs the author that the tubers are collected at any time during the dry seasons, from the middle of November to March. Very little care appears to be taken either in the cultivation or in the selection of tubers for collection. David Hooper (*Pharm. Journ.*, July 11, 1896, page 21), recorded interesting results in the cultivation of jalap at Dodabetta, on the Nilgiris, and the effect of phosphatic manures on the resin percentage, from which it might be inferred that the resin can be increased by one-half.

Out of thirteen samples which the author has examined recently, only two were in excess of the Pharmacopœia maximum. The results were:—

No.	Percentage of washed resin.
1	6·0 per cent.
2	8·2 "
3	8·0 "
4	6·7 "
5	8·7 "
6	5·4 "
7	11·3 "
8	6·2 "
9	18·4 "
10	9·6 "
11	7·3 "
12	6 4 "
13	6·5 "
Average	8·3 "

How then is the deterioration to be accounted for? By one of two theories, either by supposing that maturity, period of collection, and soil materially effect the percentage of resin, or that the root has been subjected to the treatment suggested by Flückiger referred to. The author has carefully examined the tubers that yielded 5·4 per cent. of resin, but they showed no previous treatment with solvent. They were very small, with pale exterior, starchy, and obviously immature. The tubers yielding 18·4 per cent. of resin were large, had a dark exterior, and in many instances had been sliced for drying, and were much shrivelled. He has not been able to determine that there is any considerable difference or any direct ratio, inverse or otherwise, between the proportion of starch, saccharin matter, and resin contained in the various powders examined.

Tincture of jalap is in very little demand, but it is obvious that, in order to get it with the proportion of resin required by the British Pharmacopœia, 1898 (1·5 gramme of resin per 100 c.c.), it will differ enormously in extractive, according as it is prepared from root strong or deficient in resin. The average yield of total extractive of jalap-root treated with 90-per-cent. alcohol is about 16 per cent.—in the case of the sample yielding 18·4 per cent. the extractor was as high as 25·3, and when 70-per-cent. alcohol was the menstruum, 30·9 per cent. of extractive was obtained. Tinctures prepared with 70-per-cent. alcohol from jalap containing, approximately, the quantity of resin required by the British Pharmacopœia contained about 2·3 to 2·7 grammes of extractive per 100 c.c. He has examined samples of tincture obtained from various sources, and the following yields of extractive have been obtained:—

2·9 grammes from 100 c.c.
3·4 grammes from 100 c.c.
3·5 grammes from 100 c.c.
3·8 grammes from 100 c.c.
3·7 grammes from 100 c.c.
2·8 grammes from 100 c.c.

Mr. Umney hoped that efforts will be made to improve the conditions under which the cultivation and collection of jalap are carried on, so that the standard of the British Pharmacopœia, 1898, which does not appear to be unreasonably high, may be, if possible, maintained.

Discussion.

Dr. Attfield, speaking for the British Pharmacopœia authorities, said that they were quite sure that the grounds upon which they acted in adopting the official standard for jalap were sound, and he hoped that before the next publication of the B.P. came round those in Mr. Umney's position would have ascertained why the drug had lately diminished in quality, if possible remedying the matter. That would be much better than reducing the B.P. standard. (Hear, hear.)

Mr. Ransom corroborated Mr. Umney's observations as to the present difficulty of getting jalap of B.P. standard. His laboratory-books showed that the amount varies from 8 to 13 per cent. of resin, latterly 8 per cent. being the highest, although all through 10 per cent. was almost exactly the average.

Mr. Brodie (Glasgow) said the question was, Do the properties of jalap reside in the resin or partly also in the extractive? That had yet to be settled by trial.

Dr. Symes said the moral of the communication seemed to be that the B.P. standard is right, and that the growers of jalap should be more careful in the collection of the root.

Mr. Cowley (Liverpool) drew attention to the difference in the amount of extractive in the tinctures, and considered that neglect of this variation by the B.P. was a good argument against standardisation. They should be quite sure in fixing a percentage of resin or alkaloid that in cases of deficiency no other resin or alkaloid was added, but that they could not very well tell.

Dr J. C. McWalter expressed surprise that so experienced a commercial man should suggest that the improvement in jalap depended upon the cultivators manuring the plants, and so on, when, as a matter of fact, it was a consequence of the recent low price. Jalap, he continued, had recently gone out of fashion in consequence of the increased popularity of other laxatives, such as compound liquorice-powder. He questioned if the resin was the sole active constituent, and gave the meeting the impression that the extractive bears some part of the effect. He also referred to the serious bearing that such results reveal as regards the retailer's position under the Sale of Food and Drugs Acts.

Mr. N. H. Martin hoped that the effect of the paper would be that the carelessness which had crept into the gathering of the drug would stop, and that in future it would be collected when fully ripe.

Mr. Peter MacEwan said it was quite a mistake to assume that jalap was decreasing in consumption generally. The exports from Mexico and imports into London and New

York showed conclusively that the consumption is rather on the increase. He was quite aware that locally its use had gone down, but the fact remained that the total consumption is larger. It was a mistake to assert that new remedies had squeezed out the old-fashioned drugs. This decrease in the recent percentage of resin in jalap had followed a rather prolonged period of depression in the market, so far as prices are concerned, and he thought as soon as the collectors were assured that they would get a few more pence per pound for it that the quality would be improved.

Mr. J. C. C. Payne and several other members rose simultaneously to protest against the last speaker's remarks as to the consumption of jalap. Mr. MacEwan repeated his statement that the local consumption has decreased; to which Mr. Payne replied that Ireland is not a locality, and jalap is not nearly so much used there nowadays.

Mr. W. L. Howie said that Mr. MacEwan was quite right as to total consumption of jalap, but the larger quantities now were sent to India and other places abroad.

Mr. Phillips (Wigan) said jalap was at one time largely used in his district, and is now almost obsolete.

The President said he agreed that jalap had notoriously decreased in prescriptions and the like, but it is still enormously employed in proprietary preparations, and one of which he instanced—viz., castor-oil pills. A public analyst who was sceptical about the composition of these found gamboge in them, but failed to detect the 50 per cent. of jalapin which they contained.

Mr. Umney, in reply, said he assumed that resin is the active principle of jalap, as the Pharmacopœia took that as the basis of standardisation. His real object in calling attention to the matter was that all who sold jalap might not be caught by some stray inspector under the Sale of Food and Drugs Acts, for he considered that a 40-per-cent. deficiency in this matter was far more serious than the minute deficiencies upon which some proceedings are instituted. He quite agreed that there is no need for reducing the B.P. minimum standard. (Hear, hear.)

The President then formally thanked Mr. Umney for his paper, and called upon Mr. Naylor to read

Liquor Hydrogenii Peroxidi.

By W. A. H. Naylor and C. T. Dyer.

The accuracy of the official method of assaying solution of peroxide of hydrogen has recently been questioned by different observers, the results are said to be unreliable and discordant. A paper by C. E. Smith (*Year-book*, 1898, page 106) in *Amer. Jour. Pharm.*, 1898, records a series of parallel estimations by most of the usual processes except Mason's bichromate method (*C. & D.*, 1881, page 56), and the author concludes (1) That the most accurate method is that of Kingzett; (2) that all gasometric methods are tedious and unreliable; and (3) that the permanganate especially is practically useless. Smith shows the disturbing effects of glycerin and other preservatives on the different results; but, apart from the presence of the preservatives, he does not explain what the inaccuracy of the gasometric permanganate method is due to. Other critics and objectors have also abstained from explaining the cause of its alleged unreliability. The purpose of this communication was to give this explanation.

The authors emphasise the need for bearing in mind that the volume of gas obtained varies with familiar external conditions, but in the British Pharmacopœia method there is an internal condition which causes error—viz., evolution of chlorine through the action of sulphuric acid (used along with permanganate) upon the sodium chloride of the brine with which the nitrometer is filled. Without using hydrogen peroxide at all they got with 12 c.c. of the acid permanganate solution, 0·2 c.c. of chlorine in five minutes, 1 c.c. in an hour, and 1·8 c.c. after standing five hours. One cubic centimetre of 11-volume hydrogen-peroxide solution was placed in a nitrometer with brine, and 12 c c. of the acid permanganate solution were run in. When the evolution of gas ceased, it measured 23 c.c., and it was then slowly passed through an acid solution of potassium iodide. At first nothing noticeable occurred, but gradually iodine was liberated, and when all the gas had been made to bubble through the solution, the iodine was titrated with thiosulphate solution, and the equivalent of 0·0029 gramme of chlorine, or nearly 1 c.c. by volume, was found. The operation was conducted without prolonged standing, and shows conclusively that the chlorine is more quickly produced in the presence of hydrogen peroxide. The fact that chlorine is evolved with the oxygen in uncertain quantity, and with uncertain absorption, is enough to condemn the official process as it stands.

There is no doubt that the volumetric process of Kingzett is accurate. It consists in adding sulphuric acid and potassium iodide to the solution of the peroxide, and then titrating the liberated iodine with sodium thiosulphate; but if a gasometric process be preferred there are two or three alternatives in the question of details which will make it fairly satisfactory. In the first place, to keep as nearly as possible to the official method, that process was tried without the use of brine. Mercury works well, but a large amount of it is required, and it has to be cleaned afterwards. Instead of using saturated solutions of haloid salts, sulphate of sodium in saturated solution was tried, but it was not sufficiently dense to prevent the reaction mixture from spreading down the tube, thus delaying the action, but increasing absorption of oxygen. Sulphate of magnesium is, however, excellent, and a saturated solution is easily made and gives accurate results.

The bichromate-of-potassium process, which Mason used over mercury, answers equally well with brine, no chlorine being given off. The evolution of gas is much slower than in the official process, and the oxygen obtained represents the volume of oxygen available, not double the volume. B.P. volumetric solution of potassium bichromate was used, but it must not be made acid, as acid increases the evolution of gas, and the results are discordant. The authors find that the use of permanganate and acid solution results always in the production of a larger volume of gas from a given volume of peroxide solution than is obtained when solution of bichromate is employed.

The practical objection to the B.P. method as it stands is that an article may be supplied commercially which will just pass the official limits when estimated by that process, and yet be actually under the required strength. The following figures are to the point in this connection:—

With acid permanganate over mercury	With acid permanganate over saturated solution of magnesium sulphate	With acid permanganate over brine
8·4	8·2	10·35
8·4	8·3	10·3
8·45	8·45	
8·5	8·5	
8·4		
8·45		

With bichromate over mercury	With bichromate over saturate solution of magnesium sulphate	With bichromate over brine
7·65	7·7	7·7
7·25	7·4	7·6

The figures represent the number of c.c. of oxygen obtained from 1 c.c. of solution of hydrogen peroxide. The volume of gas has in each case been corrected for temperature and pressure, and allowance made for the tension of aqueous vapour at the temperature at which the gas was measured. The results show that brine gives considerably higher figures than are obtained with mercury in the case of permanganate estimations, and those obtained with a saturated solution of magnesium sulphate are fairly concordant with the mercury figures. The bichromate results are in fairly close agreement, whether brine or saturated magnesium sulphate solution is used in place of mercury.

The Discussion

added nothing to what the authors said. Dr. Attfield was of opinion that the permanganate process is least satisfactory, and while Kingzett's is quite accurate, it is not quite convenient to pharmacists. Mr. Bird also approved of the gasometric method, and stated that he has been in the habit of using a saturated solution of ammonium sulphate instead of brine, with excellent results. Mr. **Thomas Tyrer** briefly discussed the methods of analyses suitable for retail pharmacists, and also stated that the question of the chlorine had given considerable trouble to those who washed with brine, but with ammonium sulphate solution or mercury the results are excellent.

The **President** here intimated that the first paper in the afternoon would be by Miss Clinton—the first lady to contribute a paper to the Conference.

The Conference then (1.3 P.M.) adjourned for luncheon.

Second Session.

It was 2.25 before the President could get a sufficiently large audience to do justice to Miss Clinton, who is a pretty girl of pure Celtic type, still in her teens; and she was accompanied to the platform by her employer, Dr. J. C. McWalter. The paper was on

Concerning Cascara Sagrada.

By Bridget Rose Clinton.

The fundamental law of ethics, says Herbert Spencer, is that life-preserving acts should be pleasure-giving acts. The primary principle of the neo-pharmacy of the twentieth century is, that health-giving drugs should be pleasure-giving draughts; and the application of this principle to a concrete ease—that of cascara—is the purport of this paper.

Probably one million pounds of cascara are now used per annum to stimulate the sluggish apparatus of citizens of the world. No other bark except cinchona can compare with this, and yet a quarter of a century ago an analagons species—*Rhamnus catharticus*—although well known as a cathartic, was the only kind used in medicine, and of that probably not one thousand pounds per annum. It was universally considered so drastic a cathartic as only to be fit for dyspeptic dogs and constipated curs. Now everybody loves a laxative but loathes a cathartic, and that rhamnus should be raised from the lowest and most despised to the highest and most prized of splanchine stimulants is a triumph of pharmacy.. The irritant principle of *Rhamnus catharticus*, which produced the intense griping pain, and the sanguinous discharge from the intestines, was discovered to be a kind of ferment. Now an allied species of rhamnus, distinguished as purshiana, was ascertained to be almost free from this ferment, and it has further been discovered that the ferment disappears, or, rather, is changed into a harmless substance when the cascara is stored for a couple of years. The credit of introducing *Rhamnus Purshiana* to modern medicine seems to be largely due to that American firm, whose name is associated inseparably with the drug, and the *kudos* of demonstrating the importance of keeping the bark a couple of years before use, as well as of demonstrating the utility of cold extraction, appear mostly to be the result of the researches of Mr. John Moss, whose work has by no means been sufficiently recognised.

Although the preparation of the American firm inspired the introduction of extractum cascara sagrada into the British Pharmacpœia, the official extract has always been confessedly different and less potent. In the classical monograph published by that firm, cascara is held to yield its virtues only to alcoholic solution. It has been since demonstrated that although these active principles may not be soluble in water *per se*, water certainly extracts constituents from the bark, which justify the B.P. process. The purport of this paper is to devise a satisfactory formula for syrupus cascara aromaticus. Now any fool can write a formula. The trouble is that like the famous constitutions of the Abbey Sieges they don't work.

The writer then detailed in racy fashion experiments which she has made, and the following she submitted as better than the B.P. article.

Ext. cascara liq.	ʒxvj.
Tr. aurantii	ʒiv.
Alcohol.	ʒiij.
Spt. am. ar.	ʒj.
Aq. cinnam.	ʒvj.
Syrupi	ʒxvj.

This is clear, keeps well, but it is rather bitter.

Ext. cascara sagrada liq.	ʒxvj.
Tr. carminativæ	ʒiv.
Alcohol.	ʒiij.
Aq. cinnam.	ʒvj.
Syrupi	ʒxvj.

Liquorice disguises the taste of cascara fairly well, but the bitter after-taste persists, and requires an aromatic to modify it. The following modification does so:—

Ext. cascara sagrada liq.	ʒxvj.
Aq. cinnam.	ʒiij.
Ext. glycyrrh. liq.	ʒiij.
Alcohol.	ʒij.
Syr. zingiberis	ʒxij.
Tr. aurant.	ʒiv.

Saffron has of late been denounced as inert, but it certainly seems to cover the taste of cascara in the following formula:—

Ext. cascara sagrada liq.	ʒviij.
Ext. glycyrrh. liq.	ʒiij.
Tr. aurantii	ʒij.
Ol. cassiæ	ʒij.
Syrupi croci ad	ʒxx.

The American cascara cordials are by far the most popular in the market, and it becomes necessary to try a variant of the published recipes, such as one finds in the "Pharmaceutical Formulas," and from one of these she produced the following:—

Ext. cascara sagrada liq.	℥j.
Ext. glycyrrh. liq.	ʒiij.
Ol. coriandri	♏ij.
Ol. anisi	♏ij.
Ol. cassiæ	♏j.
Tr. aurantii	ʒiv.
Ol. aurantii	♏j.
Syrupi ad	℥iiss.

Discussion.

Dr. **Attfield** said he should not like the paper to pass without comment; but, in responding to the invitation, as a man he was a little bit nervous in criticising the statements of a lady. (Laughter.) At the same time, he should say that it was all very well to go to Herbert Spencer and to say that health-giving preparations should be pleasure-giving; but, on the other hand, there was a very celebrated saying that "Salvation is acquired through suffering." (Much laughter.) However, they were invited to consider the question of the best mode of disguising the taste of cascara. He need scarcely say that the labours of the compilers of the Pharmacopœia had to be like the labours of the trunk of the elephant—to pick up a pin or the trunk of a tree—and so they were happy if they could, by a simple device, disguise in any way the unpleasant flavour, or to secure the action, of a powerful drug. Therefore he thought the lady who had given the paper need not apologise for what, with her modesty, she called its triviality. That was all he had to say on the merits of the paper; but he would like to draw attention to a question raised by the paper—that was, whether the drug should be called *Rhamnus Purshiana* or *Rhamnus Purshianus*. While the former seemed to be the better name, he would like to remind pharmacists that, in the case of all important botanical names, the name given to a plant by the discoverer must be the name used in future, whether it be right or be wrong, he was sorry to say—(hear, hear)—and he did think that the name of the man who first drew attention to a plant should be perpetuated in the name of the drug. (Hear, hear.) Hence the lady, in giving the name as *Purshiana*, although following others, was not correct, because the first man, De Candolle, who gave it the name gave it as *Purshianus*. That was why the poor Editor of the Pharmacopœia spelt it *Purshianus*, although he did not think it was right. (Laughter and "hear, hear.")

The **President** said that Dr. Attfield had been enticed by the literary character of the paper into a very interesting disquisition, which had taught some of them something and had interested them all. He had brought out the important fact of the extreme advantage of sticking to the name of a plant or drug as originally spelt. The discoverer of a plant ought to have the privilege of spelling the name as he likes. (Hear, hear.) Were it otherwise, what was correct in one generation might be thought wrong in another. (Hear, hear.) In *Bronoia* the name of Dr. Robert Brown was perpetuated, and who would suggest its change? and in *Goodenovia* that of the Bishop of Carlisle, Dr. Goodenough: would anyone suggest that the name Goodenough should be adopted instead? As to the merits of the lady's paper, those present were better able to judge than he (the President). He never took medicines. (Laughter.) Most of them did, and they could judge of the various medicaments as he sent them round. They would not get much each, though, as he had not got enough to go all round. (Laughter.)

Miss Clinton: While I am very thankful to Dr. Attfield for his remarks on my paper, I must say I prefer the feminine gender. (Laughter.)

The President: I think the majority of us prefer it too. (Great laughter.) For all that, right is right, and wrong is wrong, and in this case we shall stick to the masculine. (Laughter, and "hear, hear.") I am sure I but express your views when I say that we give a hearty vote of thanks to the member of the feminine gender who has read this paper. (Applause.)

Dr. F. B. Power next gave the meeting abstracts of the following papers, demonstrating, by means of a cold infusion of the robinia-bark, that the proteid is coagulated when the watery liquor is heated to about 80° C.

The Chemistry of the Bark of Robinia Pseud=acacia, Linné

(False Acacia or Common Locust).

By Frederick B. Power, Ph.D.

(A communication from the Wellcome Chemical Research Laboratories.)

The author, in a paper read before the Wisconsin Academy of Sciences, Arts and Letters, on December 27, 1889 (*Pharm. Rundschau*, New York, 1890, pp. 29–38), directed attention to the fact that the toxic action of robinia-bark is due to a poisonous proteid, similar in its character to ricin and abrin, and, being guided by the classification of the albuminoids adopted at that time by Hoppe-Seyler, it was stated "that it would appear to be correctly and conveniently designated as a phyt-albumose."

Some of the general chemical characters of this proteid were described, and its extremely poisonous action—manifested by severe and prolonged attacks of vomiting and purging—was also fully and satisfactorily established by experiments upon himself and his assistant, Mr. Cambier (whose name was associated with his as co-author), as well as upon animals. It was likewise shown that the proteid, which was extracted from the bark by cold water, is coagulated by heat, and that its toxic properties thereby become completely destroyed. This served to explain why in some of the preliminary experiments for the isolation of the poisonous principle a considerable amount of an extract of the bark, prepared by the aid of heat, could be taken without any ill effects. The isolation of the poisonous proteid seemed furthermore of particular interest, inasmuch as it was believed to be the first, and is as yet, apparently, the only recorded observation of the occurrence of such a body in a bark, the other allied substances, such as ricin, abrin, and crotin, being found in the seeds of the respective plants. With the advance in knowledge of the proteid substances it seemed desirable to again take up this investigation, and to examine more closely the other constituents of the bark. Dr. Power then proceeded to give details of recent German publications on the same subject, especially observations by Professor Kobert on a dissertation by Dr. Carl Lau.

Chemical Examination of Robinia-bark.

The toxic proteid or robin is obtained by adding to a cold, concentrated, aqueous infusion of the bark a considerable quantity of strong alcohol, and actively shaking, when a voluminous flocculent precipitate is produced. After standing for several hours the precipitate was collected on a filter, and washed with a little alcohol. It then forms a nearly white, slimy mass, which, when spread on plates of glass and dried in a vacuous dessicator over sulphuric acid, is obtained in the form of yellowish-brown scales. The yield of dry substance was 1·66 per cent. of the weight of the bark. In the present investigation the yield of proteid was 1·14 per cent. It may also be prepared by extracting the ground bark with a 10-per-cent. solution of sodium chloride, and subsequently saturating the filtered liquid with ammonium sulphate. The precipitate is then spread on plates of glass to dry. By this method it is associated with a considerable amount of ammonium sulphate, which may be removed by dialysis, and the filtered dialysed liquid may then be precipitated by alcohol, but during the operation a considerable portion of the proteid is rendered insoluble. For the experiments here described the proteid was prepared by simply allowing the ground bark to stand for about twenty-four hours in contact with sufficient cold water to cover it, expressing, filtering, and adding to the filtrate a large volume of strong alcohol.

Characters of the Proteid.—The precipitated proteid, either while still moist or when dried, does not again dissolve completely in water, but is rendered soluble by the addition of a little alkali. A specimen dried over sulphuric acid afforded (1) 4·12, (2) 3·74 per cent. of ash. The solution of the proteid has an acid reaction. It is precipitated by the mineral acids, and, especially when acidulated, by all the usual alkaloidal reagents, also by ferric chloride and the neutral and basic acetates of lead. The proteid affords the various colour-reactions characteristic of this class of substances—*e g*, the xanthoprotein reaction, Millon's reaction, Molisch's reaction, and Liebermann's reaction, but not the reaction of Adamkiewicz. On hydrolysis with 5 per cent. sulphuric acid a sugar was formed in small amount. It was a rather unsatisfactory osazone, melting at about 146–147° C. Fenton's hydrogen-bromide method was tried, and the negative result led the author to conclude that a ketohexose grouping of the carbohydrate complex does not exist in the proteid molecule.

In order to ascertain whether the robinia proteid, or any substance associated with it, is capable of acting as an enzyme or ferment, experiments were made, and it was found that it split up amygdalin, yielding hydrocyanic acid. It also split up potassium myronate, giving a strong odour of mustard oil. This result appears to be of particular interest, inasmuch as emulsin and beer-yeast are stated to be incapable of effecting the decomposition of potassium myronate, and the robinia ferment would therefore more closely resemble myrosin than emulsin. Whether this fermentative action represents a function of the toxic proteid, or whether it is due to a substance associated with it, is a question that must at present remain undecided. The occurrence of such a ferment indicates, moreover, that it stands in some genetic connection with a glucoside existing in the bark.

In his recently published dissertation Dr. Carl Lau records experiments with ricin, abrin, and crotin, which prove that they coagulate the casein of milk as the rennet enzyme does and Dr. Power finds that the robinia proteid does the same thing.

He next discussed the position which should be assigned to the so-called "robinia proteid" or "robin" among the various groups of related substances. Although robin has some of the properties both of an albumose and of a globulin, it differs, on the other hand, from these in being soluble in water, in being completely coagulated by heat, and in some of the reactions which are accepted as characteristic of them. It appears, moreover, quite probable that the robinia proteid consists of more than one albuminous body.

Physiological Action of the Proteid.—Dr. Carl Lau has shown that it has the property of agglutinating the red corpuscles of the blood of various animals, but that it has not this effect upon human blood or upon that of the dog and cat. Its action in this respect is also less intense than that of ricin, abrin, and crotin. Its toxic action is attended by an alteration of the kidneys, often producing a nephritis, or, at least, manifested by the presence of more or less albumen, hæmoglobin, and cylindrical casts in the urine.

The observations of Ehrlich (*Klinisches Jahrbuch*, Bd. vi., 1898, page 315) were also dealt with, and recent remarks by Mr. George Ogilvie, B.Sc., M.R.C.P. (*British Medical Journal*, May 1901, page 1070), thereon. Mr. Ogilvie says: "Ehrlich's ingenious experiments—made on mice with the vegetable toxins of ricin, abrin, and robin—have led him to the conclusion that no trace of immunity is ever conferred by parent upon offspring through the germinal cells, either by the sperm or by the ovum."

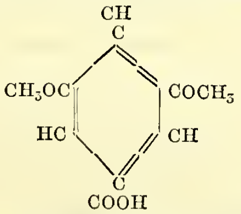
Other Constituents of the Bark.

The author next described at considerable length his examination of the bark for the purpose of isolating such constituents as may be extractable with light petroleum, ether, chloroform, and alcohol, successively. Small experimental quantities were first tried, then 1-kilo. lots, and complete details of the experiments were given. Acidulated water and cold water were also employed to extract the bark.

These experiments culminated in the following, undertaken with the hope of determining not only the character of a substance extracted which afforded alkaloidal reactions, but the nature of a glucosidal body whose existence had been indicated: —

Seven kilos. of the ground bark were extracted with hot alcohol in a continuous-extraction apparatus, and the alcohol for the most part distilled off. The dark-coloured liquid thus obtained was mixed with water to separate fatty and resinous matter, and the liquid filtered. The filtered liquid was then treated with basic lead acetate, which produced a dense precipitate consisting chiefly of tannic and colouring-matter, but apparently nothing of further interest. The filtrate from the lead precipitate was treated with hydrogen sulphide, and again filtered, when it had a bright-yellow colour. It was now concentrated under diminished pressure, in order to avoid any darkening in colour, until it acquired an almost syrupy consistence. On further evaporation it formed a thick syrup, but without a distinctly sweet taste. A small portion which had been allowed to stand for a considerable length of time deposited a few small, needle-shaped crystals, which could not be separated from the syrupy liquid, but which will be referred to later. The liquid shows the following behaviour towards reagents. It is precipitated by all the usual alkaloidal reagents, and more abundantly when acidulated with hydrochloric acid. When heated with an alkali hydrate it evolves ammonia, at the same time developing a peculiar odour, reminding somewhat of methylamine. It slightly reduces Fehling's solution, but much more strongly after heating with hydrochloric acid. The original solution was dextrorotatory, and afforded an osazone melting at 197° C.

The entire liquid was now divided into two equal parts, which may be designated as A and B. A. To this portion of the liquid an aqueous solution of mercuric chloride was added in excess. A light coloured precipitate was formed, but examination of it gave an indefinite result. The filtrate was treated with hydrogen sulphide, and filtered. To the strongly acid liquid, which still gave the alkaloidal reactions as strongly as before, an additional 10 c.c. of hydrochloric acid were added, and it was then boiled in a flask provided with a reflux condenser for about three hours. The liquid, when cold, was filtered from a considerable amount of black resinous substance, and distilled. The distillate, which had a peculiar aromatic odour, was shaken out with ether, the latter separated and allowed to evaporate, when a small amount of an oily residue was obtained, having an aromatic, vanilla-like, but at the same time somewhat empyreumatic, odour. It gave no reaction with ferric chloride. The strongly acid liquid remaining in the flask was again filtered, and shaken several times successively with ether. The ethereal liquids were of a reddish colour, and when evaporated left a dark-red oily residue. On treating this with water a small amount of white needle-shaped crystals were separated. These were collected on a filter, and after washing with a little chloroform and ether, in which they were not very freely soluble, they were obtained quite white. The purified crystals were white, silky needles, and contained no nitrogen. They melted sharply at 198°–199° C. (corr.). The crystals have an acid reaction to test-paper, and when brought into a little solution of caustic potash or soda they dissolve with a rose-red colour, which soon fades. Nitric acid produces a deep-red colour, soon changing to yellow, and ferric chloride produces a slight brown coloration. When dried in a water-oven at 100° C. the crystals lost nothing in weight, and were then analysed, 0·0422 gramme giving 0·0836 gramme CO_2 (= C 54 per cent.), and 0·0194 gramme H_2O (= H 5·1 per cent.). The figures agree remarkably well for a body of the composition $C_9H_{10}O_5$, which is that of syringic acid, or the 3·5 – dimethyl ether of gallic acid.



It is known that syringin, when oxidised, is converted into glucosyringic acid, and that the latter by hydrolysis forms syringic acid and glucose. This would easily explain in the present instance the occurrence of the small amount of syringic acid which Dr. Power found associated with syringenin in the products of hydrolysis.

It is an interesting fact that sinapin, which occurs ready formed in black mustard-seed, and which is likewise formed from the sinalbin contained in white mustard-seed through the action of the ferment myrosin, is converted by the action of alkalies into choline and sinapinic acid, and that the latter body is assumed to stand in direct relation to syringenin, syringenin being regarded as the alcohol of sinapinic acid (Compare van Rijn, *loc. cit.*, page 198). This naturally suggests the possibility of some intimate organic connection between the enzyme and the glucoside of robinia-bark.

The hydrolysed liquid, which had been extracted by ether, yielded with potassium-bismuth iodide a considerable amount of a flocculent, brick-red precipitate. This was washed with a little acidulated water, then suspended in water, and decomposed by hydrogen sulphide. The filtrate, after appropriate treatment, yielded an amorphous aurichloride, which melted somewhat indefinitely at about 117° C., and on analysis gave 38·06 per cent. Au and 38·04 per cent. Au, so that it could not be choline aurichloride, which requires 44·4 per cent. of gold.

A second portion (B) of the original liquid gave a tannin precipitate, which ultimately yielded the same uncrystallisable alkaloidal body.

The filtrate from the tannin precipitate was oxidised in the hope of getting gluco-syringic acid, but oxalic and succinic acids were obtained.

Dr. Power next described his examination of the bark for resins, of which he isolated (1) soft 1·23 per cent., and (2) hard 0·53 per cent., and after describing an examination of the leaves of the robinia, which was of a negative character so far as soluble proteid or alkaloid is concerned, he briefly summarised his observations, noting that the constituents are:—(1) The poisonous proteid, robin; (2) one or more substances of an alkaloidal nature which are easily decomposed, even by so weak an alkali as silver hydroxide, with the evolution of ammonia and small amounts of an amine. It is very probable that they represent degradation products of the proteid; (3) syringic acid, $C_9H_{10}O_5$, and syringenin, together with glucose, were obtained as products of hydrolysis; and (4) a small amount of tannin, some amorphous colouring-matter, a sugar — probably glucose—and a considerable amount of fatty matter and resin.

In the latter part of this investigation the author was assisted by Dr. H. A. D. Jowett and Mr. F. H. Lees.

Anatomy of the Bark of Robinia Pseud-acacia.

By P. E. F. Perrédès, B.Sc., F.L.S., Ph.C.

Robinia Pseud acacia is a handsome long-lived tree, native of North America, extending from Pennsylvania to Northern Georgia. It is stated by Michaux that it was one of the first trees introduced into Europe from the forests of North America, east of the Mississippi, and that the seeds were received from Canada by John Robin, herbalist to Henri IV. of France, and cultivated by him on a large scale about the year 1601. According to others the seeds were sent to Vespasian Robin (son of the preceding), who was arborist to Louis XIII., and were planted by him in the Jardin des Plantes in Paris in 1635. It will be seen that the name "Robinia," given to the genus, has reference to these historical associations. Since the period referred to, this tree has become extensively propagated, and is now well known in France, England, and Germany.

The bark under examination consists of flexible longitudinal strips 1·5–2 mm. thick (fig. 1) and of a pale-yellow colour. It is entirely composed of inner bark (bast tissue), the outer surface showing shallow longitudinal depressions due to the removal of the outer bark (*dep*, fig. 1). The inner surface is marked with slight, smooth, longitudinal striations, while under a lens innumerable longitudinally extended small dark lines are visible, these being due to the bast fibres; it is frequently crossed by transverse wrinkles (*wr.*, fig. 1). The bark is exceedingly fibrous, breaking with difficulty, and showing a laminated fibrous fracture (*lam.*, fig. 1); the radial longitudinal cut surface shows protruding threads of fibre groups when frayed (*f.t.*, fig. 1); some of these threads also occur scattered over the outer surface where the outer bark has been peeled off (*f.t.*, fig. 1).

The transverse section shows, under a lens, a decussating arrangement of white lines, the radial lines being due to the medullary rays and the tangential ones to bast parenchyma and sieve-tissue. On closer examination it is seen that at fairly regular intervals some of the tangential lines are wider than the others (*w.l.*, fig. 2); the cause of this will be noticed later on. Owing to this distribution of the tissues the bark is easily split into thin laminæ.

In the sketch a piece is shown to which the brownish outer bark was still attached (*o.b.*, fig. 2); this also consists of bast tissue, the cortical portion having been thrown off at this stage—that this is so is shown by the fact that the bast-rays extend right up to the outer limit of the bark. This outer bark is traversed by tangential bands of cork (periderm) which appear as darker rings (*per.*, fig 2).

The inner bark has a bean-like taste, and, although odourless when dry, it develops a very pronounced bean-like smell when moistened.

The anatomical examination was then described in detail by the author, whose figures and description we reproduce.

Cell-contents—The contents of the elements of the outer bark consist mostly of brown colouring-matter blackened on treatment with ferric chloride. The fibres of the inner bark have few contents, if any, and those of the sieve-tubes are slight. The cells of the medullary rays and those of the bast parenchyma are, on the other hand, filled with proteid material.

Starch is entirely absent, but all the parenchymatous cells of the younger barks shown in figs. 3 and 8 contain starch; whether this would be the case in the one under consideration at a different period of the year (the present bark was collected in the spring) still remains to be shown.

Explanation of Figures.

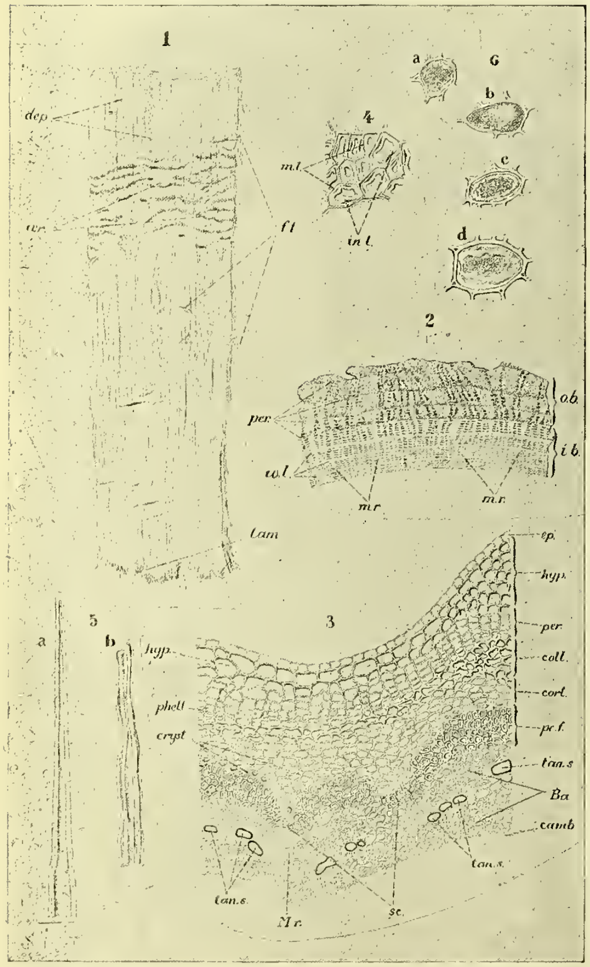


Fig. 1.—Inner bark, outer surface: *f.t.*, protruding fibrous threads; *dep.*, shallow longitudinal depressions; *lam.*, laminated fibrous fracture; *wr.*, transverse wrinkles (these are much more numerous on the inner surface). Nat. size.

Fig. 2.—Transverse section through entire bark: *o.b.*, outer bark; *i.b.*, inner bark; *per.*, tangential bands of cork in outer bark; *w l.*, wider tangential lines occurring at intervals in inner bark; *m.r.*, medullary rays. Magnified 8 diameters.

Fig. 3.—Transverse section of bark from a young twig 4 mm. thick: *ep.*, epidermis; *hyp.*, hypoderma, many cells thick in ridges, usually 1½ cells thick in furrows; *per.*, periderm; *phell.*, phellogen; *coll.*, collenchymatous portion of cortex; *cort.*, portion of cortex consisting of thin-walled parenchyma; *pc.f.*, semi-lunar masses of pericyclic fibres; *cryst.*, crystal-sacs with crystals; *tan.s.*, tannin sacs; *ba.*, bast; *sc.*, stone cells; *m.r.*, medullary ray; *camb.*, cambium. Magnified 150 diameters.

Fig. 4.—Pericyclic fibres in transverse section: *m.l.*, lignified portion of wall, the remainder being gelatinous in appearance, not lignified, and frequently with an inner distorted half (*in.l.*). Magnified 300 diameters.

Figs. 5*a* and 5*b*.—Portions of pericyclic fibres isolated by maceration: *a*, about a third, and *b*, a quarter of a fibre. Magnified 300 diameters.

Figs. 6*a*, *b*, *c*, and *d*.—Transverse sections of tannin sacs. Material preserved in alcohol, sections mounted in glycerin Magnified 300 diameters.

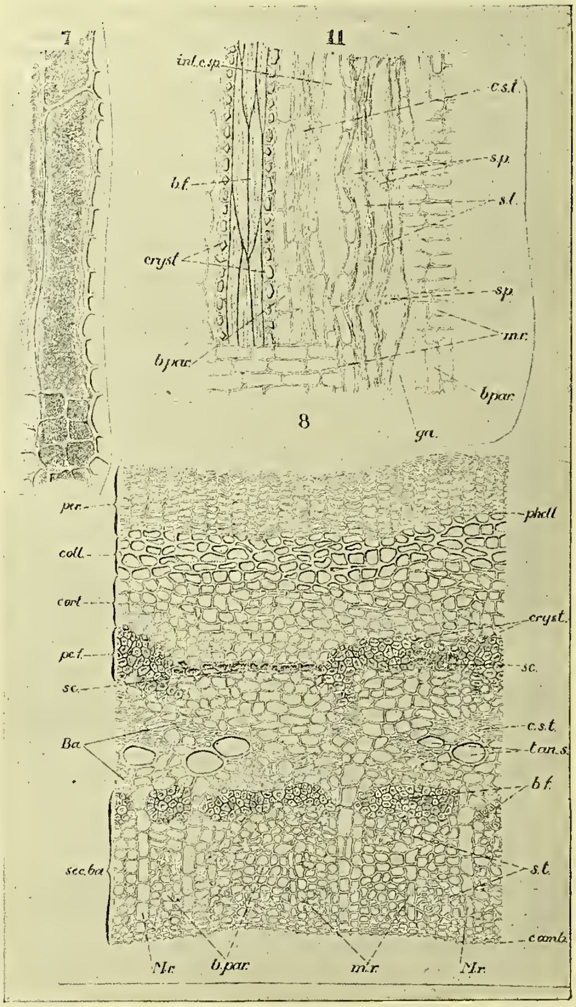
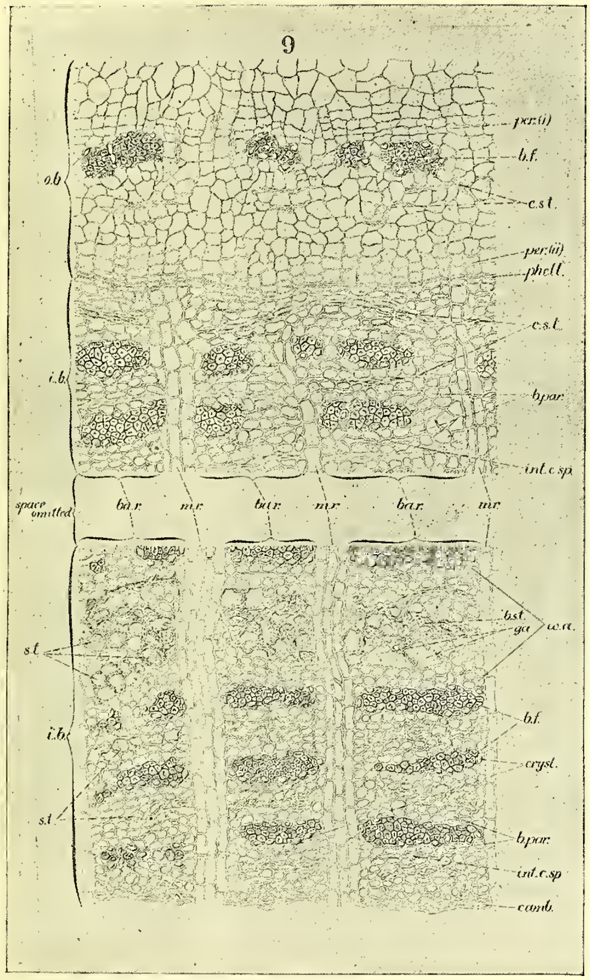


Fig. 7.—The same in longitudinal section. Magnified 300 diameters.

Fig. 8.—Transverse section of bark from an older twig about 6·5 mm. in diameter: *c.s.t.*, collapsed sieve-tissue; *sec.ba.*, secondary bast; *b.f.*, fibre-groups of secondary bast; *s.t.*, sieve-tissue; *b.par.*, bast parenchyma; *m.r.*, new medullary rays; other lettering as in fig. 3. Magnified 150 diameters.

Fig. 11.—Transverse section through portion of fibre-group: *f.*, fibres with a lignified outer portion (*m.l.*), and a gelatinous inner portion (*in.l.* (*i*) and *in.l.* (*ii*) showing a striated appearance (note the conspicuous middle stria dividing the inner portion into two halves (*in.l.* (*i*) and *in.l.* (*ii*)); *cryst.*, crystal-sacs, showing crystals of calcium oxalate enveloped in a thin membrane; other lettering as in fig. 9. Magnified 400 diameters.



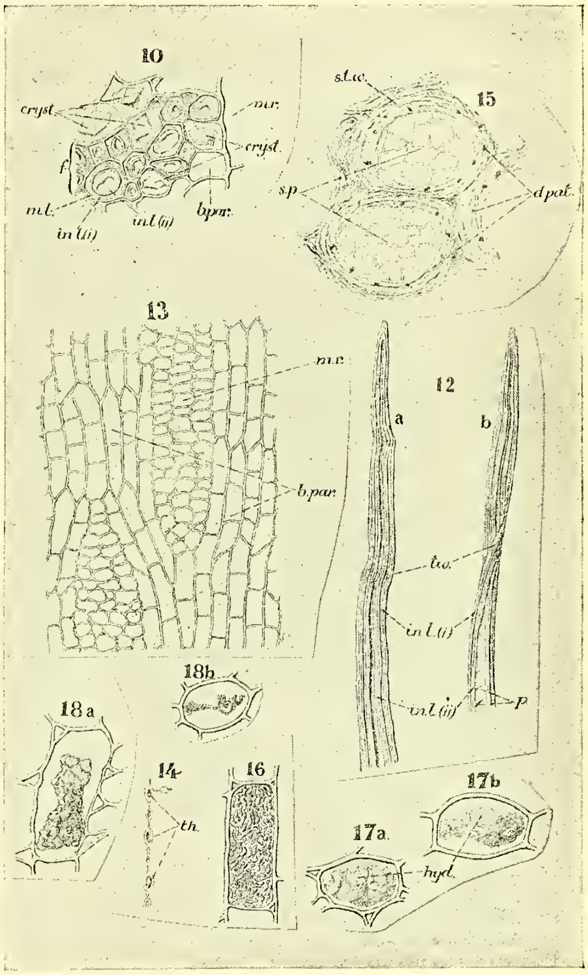


Fig. 9.—Radial longitudinal section through one of the wider areas of fig. 8: *s.p.*, sieve-plates; other lettering as in fig. 8. Magnified 150 diameters.

Fig. 10.—Transverse section through portion of bark shown in fig. 2: *o.b.*, inner portion of outer bark: *i b.*, inner bark; *ba.r.*, bast rays; *m.r.*, medullary rays; *per.* (*i*), disorganised phellogen and periderm.; *phell.*, phellogen; *per.* (*ii*), periderm in course of formation; *b.f.*, groups of bast fibres; *c.s.t.*, collapsed sieve-tissue; *b.par.*, bast parenchyma; *int.c.sp.*, intercellular space; *w.a.*, wider area with copious development of sieve-tissue; *s.t.*, sieve-tubes with gelatinous walls and conspicuous transverse sieve-plates; *b s.t.*, sieve-tissue breaking away from the surrounding bast parenchyma; *ga.*, gap caused by the breaking down of the sieve-tissue; *cryst.*, crystal sacs; *camb.*, cambial region. Magnified 150 diameters.

Figs. 12 *a* and *b*.—Portions of fibres of secondary bast, isolated by maceration: *tw.*, twist in fibre; *p.*, pits; other lettering as in fig. 11. Magnified 400 diameters.

Fig. 13.—Tangential longitudinal section passing through the bast parenchyma. Lettering as in previous figures. Magnified 150 diameters.

Fig. 14.—Cell-wall of bast-parenchyma cell in tangential longitudinal section, treated with chloral-hydrate: *th.*, thickenings of the wall. Magnified 400 diameters.

Fig. 15.—Sieve-tubes in transverse section, showing the conspicuous sieve-plates (*s.p.*): *s.t.w.*, gelatinous sieve-tube wall; *d pa.*, darker patches in sieve-tube wall. Section treated with Schulze's solution. Magnified 500 diameters.

Fig. 16.—Cell of medullary ray with contents, showing action of alcohol (not a very satisfactory preparation). Magnified 400 diameters.

Fig. 17*a* and 17*b*.—Cells of bast parenchyma with contents, treated with Schulze's solution: *hyd.*, vacuoles. Magnified 400 diameters.

Fig. 18*a*.—Cell of medullary ray, and 18*b*, of bast parenchyma with contents, section treated with Millon's reagent. Magnified 400 diameters.

DISCUSSION.

The PRESIDENT said if there was a decadence in pharmacy there was no decadence in the work done by them, as shown in this paper (referring to the first). It showed the masterly touch of the man who had such a lot to do with the making of the U.S. Pharmacopœia. (Applause.)

Mr. NAYLOR asked if the proteid was in solution, could the solution be passed through a porcelain tube so as to give the reactions, and could the enzyme be obtained in an isolated condition?

Dr. ATTFIELD said for thirty or forty years pharmacists have been regarding *Robinia Pseud-acacia* as more or less of a mystery, which Dr. Power had to a very considerable extent unravelled, or at least he had thrown more light upon the matter than any other. This he had done at an enormous cost of labour on his own part and on the part of his colleague, Mr. Perrédès. (Applause.)

Dr. POWER, in reply to Mr. Naylor's question, said he had not made a direct experiment, but the enzyme was undoubtedly a colloid body like the proteid, and could not be separated by any process of dialysis.

The PRESIDENT remarked upon the toxic properties of this particular species, and referred to one or two plants in Natal also possessing like toxic properties. The working-out of this particular poisonous property by Dr. Power had been done in a manner which they as pharmacists fully recognised, and they cordially tendered to him and Mr. Perrédès their most cordial thanks. (Loud applause.)

Two papers on standardisation were then read, Mr. Martin's by himself, and Mr. Henry Gadd reading that of his son, who was unable to be present, owing to the illness of his wife.

Standardisation of Galenical Preparations.

By N. H. Martin, F.C.S., F.L.S.

The time is opportune for an inquiry as to whether the methods adopted in the Pharmacopœia secure not only constancy in the strength, but also identify the preparation with its nominal source, and ensure the full therapeutic value of all the constituents of the crude drug. The author has been struck with the lack of uniformity in the results obtained, and that the identity of the alkaloidal principle is not always required. Merck points out, in reference to the German Pharmacopœia tests for the extracts of henbane, belladonna, &c., that it is quite easy to adulterate them so that they satisfy the requirements, but in many cases it is even impossible to demonstrate the fact of adulteration. In this connection the author especially instanced the two ipecacs, Rio and Cartagena, showing that both may yield the same percentage of alkaloids, but without distinguishing tests for emetine and cephaëline the assay is comparatively worthless.

Studying the history of all vegetable drugs we find their reputation for the relief of pain, or for the cure of disease, preceded any knowledge of their chemical constituents, and was built up by an accumulated consensus of experience that certain effects invariably follow the administration of crude drugs, or the simplest preparations of such drugs. Cinchona-bark had an established reputation long before the discovery of quinine, and even now preparations of cinchona-bark have a wide field of usefulness which cannot be limited to the quinine factor alone. We look in vain for an accumulation of opinion as to the value of any of the glucosides or principles of digitalis or ergot. Variation in the activity of certain preparations is due to the natural variation of the crude drugs; this and other circumstances (damage by age or improper keeping) cannot be detected by the methods of chemical analysis. Is it unfair to assume that a manufacturing chemist who would use such samples of crude drugs would also manipulate a preparation of a drug up to the titration standard required in the Pharmacopœia by the addition, if need be, of innocuous alkaloids, or even of organic bases totally innocent in their origin of any connection with the drug whose name was attached to the finished product? The aim of the Pharmacopœia should be, then, to enable every pharmacist to guarantee from his own knowledge the absolute identity of the finished product with its supposed source. If the processes of manufacture are such as cannot be worked economically except on the large scale, or assay methods adopted which admit of sophisticated preparations being made to respond to the standards or the valuation methods, relatively costly in time and material, the initial factor of identification is taken out of the hands of the pharmacist, who should be responsible.

To avoid, on the other hand, interference with the activities of the drug, concentration to the saturation-point should be avoided. Crude drugs should be described with greater care and fulness than at present. Indications might, where possible, be given as to the activity of the drug, until accumulated knowledge enabled us to fix a certain percentage of any principle as the minimum standard of quality. Chemical assay should be carried out on the crude drug, and if in addition there are certain preparations of such drug which admit of being standardised, this should be done by a process which would render the identification of the separated alkaloid a certainty. Starting with such carefully identified and assayed crude drugs, if precise instructions are given as to fineness of powder and general treatment the preparations of tinctures, &c., will not vary within limits which will interfere with their usefulness. Without wishing to discourage research on vegetable drugs, it is not fair to medical men to introduce misleading valuations of complex galenical preparations in the Pharmacopœia. A wider range of alkaloids and definite proximate principles might be introduced in the Pharmacopœia to give medical men the opportunity of obtaining experience of them in place of the crude drugs and galenical preparations from which they are obtained. Natural selection would then determine which were the most valuable remedies, but the process should not be hastened in any way. It will require the intelligent co-operation of a large number of practical men, with special opportunities of observing the effects of climate, soil, seasons, age of plants, time and conditions of collection, &c., to make comprehensive experiments and investigations in the assay of crude products, and especially as to the identification of isolated principles. In this way knowledge would be accumulated which would enable us to decide whether it is wise to continue and extend the present plan of assaying the finished preparations, or whether it may not be better to apply all the tests possible to the crude drugs, from which preparations could be made varying within only small limits.

The Standardisation of Galenicals.

By H. Wippell Gadd.

The author divides galenicals into two classes. First, preparations that are or can be standardised to a percentage of some definite chemical substance, which although not necessarily the only active ingredient, is a fair index of the quality of the drug used, and consequently of the finished product. The second class includes preparations, the active ingredient of which is unknown, or cannot be readily isolated, and which can only be standardised by physical tests, such as sp. gr. and percentage of extractive.

Referring in detail to a few things in the first class, he said that the official process for assaying liquid extract and tincture of nux vomica, as modified by Farr and Wright, gives satisfactory results, but the Pharmacopœia requirement of 1·5 per cent. of strychnine in the liquid extract, is too high. The author has not been able to obtain a parcel of beans which contained more than half that amount of strychnine, and has found it necessary to use much more than a pound of the drug to produce a pound of the fluid extract. The official processes for the assay of the preparations of cinchona are satisfactory, but Mr. Gadd has not obtained such uniformly exact results as would lead him to condemn a sample which showed a deficiency of 0·04 per cent., as has recently been done by a public analyst. A curious proof of the value of standardisation was noted. A parcel of bark crushed for manufacturing purposes was stored in a room over the mill-room, where the vibration caused by the machinery was felt to some extent. Portions were taken from time to time and made into the official preparations in the ordinary way, but on analysis the results were by no means concordant with the composition of the original bark. Apparently the constant slight vibration separated the lighter and heavier particles of the bark, and the comparatively inert from those rich in alkaloids. This result would probably not have been observed, if the strength of the finished products had not been estimated. Edmund White's recommendation that belladonna-root of at least 0·4 per cent. of alkaloidal content should only be used, was commended, but it is not altogether a realisable condition for the author has found 0·62 per cent., 0·40 per cent., 0·48 per cent., 0·28 per cent., 0·3 per cent., 0·3 per cent., 0·35 per cent., 0·4 per cent., and 0·37 per cent. of alkaloid in ten specimens examined in the ordinary way of trade.

With regard to the second class of galenicals, doubt has been expressed as to the utility of attempting their standardisation, but the author testified to its usefulness as a check on manufacturing. The following notes illustrate this observation:—

Tincture of Asafetida.—As it is impossible to get any quantity of the gum which conforms to the standard of the Pharmacopœia, it is necessary to standardise the tincture to 10 per cent. of extractive.

Compound Tincture of Benzoin.—If the extractive falls much below 18 per cent. it is evident that inferior benzoin or storax, or both, have been used.

Tincture of Myrrh.—Figures for the extractive, varying from 4·4 per cent. to 8 per cent., have been obtained, but generally a lower percentage than 6 per cent. would seem to be indicative of the use of an inferior gum.

Compound Tincture of Rhubarb.—Very variable results have been obtained, depending partly on the length of time during which the solids are dried, constant weight being almost unattainable. It is essential in all cases that a uniform time of drying be adopted—say two hours in the water oven.

Extract Cascara Sagrada Liq.—The extractive varies from 20 to 27·5 per cent., and most samples are near the lower limit.

An attempt was made to compare the B.P. concentrated liquors, and also some concentrated commercial infusions, with fresh infusions, by estimating the amount of extractive in each case, with the following results:—

Infusion of orange (fresh)	1·43	per cent.	extractive
„ „ (concentrated 1 to 7)	10	„	„
„ calumba (fresh)	0·54	„	„
„ „ (conc. 1 to 7) ...	3·29	„	„
Liq. calumba conc. B.P.	4	„	„
Infusion of cascarilla (fresh)	0·27	„	„
„ „ (conc. 1 to 7) ...	1·96	„	„
„ cloves (fresh)	0·59	„	„
„ „ (conc. 1 to 7) ...	2·66	„	„
„ buchu (fresh)	1·25	„	„
„ „ (conc. 1 to 7) ...	5·47	„	„
„ digitalis (fresh)	0·28	„	„
„ „ (conc. 1 to 7) ...	1·42	„	„
„ serpentary (fresh)... ...	1·38	„	„
„ „ (conc. 1 to 7)...	8·86	„	„
Compound infusion of gentian (fresh)	1·02	„	„
„ „ „ (conc. 1 to 7)	15·42	„	„
Infusion of senega (fresh)	0·88	„	„
„ „ (conc. 1 to 7) ...	8·46	„	„
Liq. senegæ conc. B.P....	10	„	„
Acid infusion of roses (fresh)	0·73	„	„
„ „ „ (conc. 1 to 7) ...	7·22	„	„
Infusion of rhubarb (fresh)	1·67	„	„
„ „ (conc. 1 to 7) ...	10·65	„	„
Liq. rhei conc., B.P.	10	„	„

It is evident, says the author, that whatever their virtues the concentrated infusions and liquors do not exactly represent the fresh infusions for which they are substituted.

With regard to tinctures, the author has not found reason to modify the figures for percentage of extractive which he published in conjunction with Mr. C. G. Moor, except in three cases, viz.:—

Ammoniated Tincture of Ergot.—Four per cent. is too high a figure for the extractive.

Tincture of Pellitory.—The author has obtained results nearer 0·5 per cent. than 1·5 per cent.

Tincture of Cascarilla.—Some abnormal results have been obtained, the extractive being as low as 1·285 per cent., but this was traced to the fact that a bark containing a high percentage of ash had been inadvertently used. The standard for extractive should, however, be 2 per cent., not 3 per cent.

The great diversity in appearance of commercial samples of compound liquorice-powder seems to suggest that they do not all strictly conform to the B.P. standard. The demand of late has been for a light-coloured powder, and a fashion prevails of grinding all the powders together. As this must be followed by sifting it is difficult to see how the correct balance of the ingredients can be maintained, for the fennel, liquorice, and even the senna, naturally yield more "gruffs" than the sulphur or sugar. A sample made from powders ground separately showed moisture, 4·15 per cent.; ash, 4·3 per cent.; and soluble ash, 2·685 per cent.

A tincture was prepared by macerating 5 grammes of the powder in 70 c.c. of 70-per-cent. alcohol. This yielded 4·475 per cent. of extractive.

Two commercial samples were examined. Sample A yielded moisture, 6·35 per cent.; ash, 4·5 per cent.; and soluble ash, 2·8 per cent.; while the extractive of a tincture made from the powder was 4·835 per cent. In sample B moisture was 5·4 per cent.; ash, 4·5 per cent.; soluble ash, 3·15 per cent.; and the tincture extractive, 3·73 per cent. Further experiments are necessary to prove if these figures are of value as a gauge of quality.

With regard to extract of malt now in the Formulary, the standard set for diastasic strength is comparatively low, and there should be no difficulty in obtaining commercial samples which will conform to it. The results have been obtained in the ordinary course of laboratory work:—

Sample A digested 2½ times its weight of potato-starch, at 158° F. (70° C.), in 12½ minutes; B, ditto, in 10½; C, ditto, in 6½; D, ditto, in 6; E, ditto, in 22½; F, ditto, in 6; G, ditto, in 4½; H, ditto, in 13; and I, ditto, in 15 minutes.

Sample J digested its own weight of potato-starch, at 100° F. (38° C.), in 4½ minutes; K, ditto, in 4; L (1), ditto, in 6½; L (2) digested its own weight of arrowroot, at 104° F. (40° C.), in 6; M digested its own weight of potato-starch, at 100° F. (38° C.), in 4½; and N, ditto, in 8 minutes.

A sample of liquid extract digested twice its weight of potato-starch, at 100° F. (38° C.), in 10½ minutes.

Since the publication of the Formulary he has examined a commercial sample, and found that it digested its own weight of arrowroot, at 100° F. (38° C.), in ten minutes.

DISCUSSION.

Mr. **MABEN** said the point of Mr. Martin's paper appeared to be the reputation of generations of experience in galenical preparations. In the first place, the reputation of drugs had been founded upon the results attained by using certain drugs. There were preparations made from good drugs as well as from bad drugs, and it must not be assumed it was only this generation that had a monopoly of good and bad drugs. He assumed that past generations had the same thing to contend with; but Mr. Martin admitted that the reputation of a drug had been based on good drugs alone in the past, and not on bad drugs. The advocates of standardisation claimed that preparations should be provided for pharmacists which would be uniformly good, and have no bad drugs at all. In the case of jalap, there was a 5-per-cent. and an 8-per-cent. jalap, and he thought it would be infinitely better to have a uniform preparation of jalap in accordance with the requirements of the Pharmacopœia. It must not be thought that because a preparation was standardised an assurance was thereby given that the preparation contained nothing but the most active principle—it only contained a proportion of that principle. They could not standardise crude drugs; but they could continue doing what has been already done in the Pharmacopœia, and that was to increase the number of standardised drugs.

Dr. **GRIFFITHS** said, as a medical man, he would like to say a few words upon the importance of giving proper alkaloidal galenical preparations. He had for a long time used crude drugs, or their preparations, in preference to alkaloids; but he now recognised that in some cases the latter were preferable, while at the same time holding that the comparison between crude drugs and their alkaloidal preparations was analagous to that of a pound of beef as compared with Liebig's extract. The extract was all very well for an emergency, but if one wanted to keep going, the pound of beef was better. (Hear, hear.) He then gave an instance of a little girl who had been treated by his brother giving her 8 minims of liquor strychniæ, and when she related to him the sensations she had on taking the drug, he saw that the symptoms portended strychnine-poisoning. He gave the little girl another bottle, substituting quinine for the liquor strychniæ. He (Dr. Griffiths) had on one occasion saved a child's life by giving her heroic doses of liquor strychniæ in pneumonia. He would say it was the duty and the province of the members of the Conference to supply medical men with good galenical preparations. It was much better to have the Pharmacopœia compiled by a large number of scientific men, like the members of that Conference, than to have it the work of one or two men. The medical profession were quite content to leave the matter in the hands of the members of the Conference. As Mr. Druce had said at the luncheon that day, there was not much community of feeling between chemists and medical men; he (Dr. Griffiths) would say that if there were more opportunities of them coming together to talk matters over, the better would it be for all. (Applause.)

Mr. **BIRD** said that he thought preparations of belladonna were mentioned in the paper on standardisation, and he would like to place on record the following facts, for which he was indebted to Messrs. Stafford Allen & Son. They had reference to the yield of extraction. The first year's root gave 32·4 per cent., the second 30 per cent., and the third year's 28·2 per cent., using the menstruum directed for ext. belladonnæ liq.

Mr. **COWLEY** asked Mr. Gadd what kind of cinchona-bark was referred to in the curious observations reported. He also thought Mr. Martin's paper did not seem to leave them in a much better position than before with regard to alkaloid extractives.

Dr. **MCWALTER** said that Mr. Martin deserved their best thanks for drawing attention to the standardising of galenicals; it appeared to him that a revolution had been effected in pharmacy, by the operation of the Pharmacopœia, which had not been recognised. Take tincture of opium. Formerly one got a preparation of this made by the pharmacist himself, on whose results they could definitely and uniformly rely; but at present when one asked for tincture of opium one got a spirituous liquid of a brown colour, and the only thing one knew that it contained was 0·75 per cent. of morphine. Professor Leech said that tincture of opium was nothing but morphine and that tr. nucis vomicæ was nothing but strychnine. In some cases atropine-poisoning had occurred from the use of the new and strong tincture of belladonna which had replaced the old-fashioned tincture. As Mr. Martin had pointed out, the inevitable result of standardisation would be to confine the making of the preparations to wholesale houses, because it would not pay the ordinary pharmacist to prepare them himself. He ventured to say that the number of houses now making tincture of opium was not 10 per cent—(cries of "Oh!")—because it would not pay the ordinary chemist to standardise tincture of opium. ("Oh!") In spite of these protests he maintained his ground, and said Mr. Gadd's figures were of immense and incalculable value.

Professor **Attfield** said it was now five minutes to 5 o'clock, and he begged to move the adjournment of the discussion. He did so because he realised its great importance. (Hear, hear.) They ought to keep faith with the local committee, who were awaiting to take them to Dalkey. (Hear, hear.) In moving the adjournment he would just say this much—that Dr. McWalter had not accurately represented the opinion of the late Dr. Leech. (Hear, hear.)

The Conference then adjourned for the day.

Third Session.

The taking of a group-photograph on Wednesday morning threatened to delay the proceedings, but the President took the chair punctually at 10 o'clock. The Secretaries, the Treasurer, Dr. Attfield, Mr. N. H. Martin, Mr. H. Gadd, and Professor Prescott accompanied him to the platform. Later, Mr. W. F. Wells, Sir Thomas Robinson, and Mr. J. C. C. Payne joined them there. In order to give the laggards time to come in, the **President** asked Dr. Attfield to give the gist of the following paper to the audience of about fifty:—

Estimation of Phenol when Mixed with Resinous Substances.

By John C. Thresh, M.D., D.Sc., &c.

A little time ago the author desired to estimate the amount of phenol in samples of carbolized gauze, in which the phenol is "fixed" by aid of resin. A gauze which was said to contain 5 per cent. of phenol, when examined by the usual process gave results which were not concordant and varied from 1 5 to 2 per cent. The usual process, described in Allen's "Commercial Organic Analysis," consists in dissolving out the phenol and other substances with ether, shaking the solution obtained with dilute alkali, liberating the phenol by acid and taking up with ether &c. Upon mixing phenol with resin and trying this process, it was found to be useless for the purpose.

After numerous experiments the author devised the following simple process, which gave very concordant and accurate results:—

> The gauze, about 20 grammes, was placed in a flask capable of holding about 700 c.c. of water, and 500 c.c. of water acidulated with hydrochloric acid added, and a few fragments of granulated zinc. Heat was applied and about 300 c.c. distilled over slowly. This practically contains the whole of the phenol, and it can be readily determined by the bromine process.

The zinc enables the boiling to be carried on steadily, and the gas-bubbles, with a little manipulation, keep the gauze from matting together.

When testing the method the author mixed various quantities of phenol with an alcoholic solution of resin, poured the mixture upon some clean gauze, dried rapidly by shaking for a minute in warm air, and then introduced it into the flask. The results obtained were:—

Calculated percentage of Phenol in gauze	Amount of Phenol found
6·0	5·88
6·0	5 64
4·0	3 75

There is undoubtedly a little loss of phenol in the drying of the gauze. This is well known by the manufacturers, and an access of phenol is added in order to ensure the full percentage in the finished product. The samples certified to contain 5 per cent. by the manufacturers gave the following results:—(*a*) 4·70, (*b*) 4·91, (*c*) 4·96, and (*d*) 4·86. It was found that the gauze in the centre of each packet usually gave a little higher result than that from the outside, the loss being, no doubt, due to evaporation. The following results were obtained from various parcels:—

	Outside	Inside
1.	4·60	4·83
2.	4·70	4·93
3.	4·75	4·90
4.	5.03	4·90
5.	4·76	4·96
6.	4·40	5·40

No. 4 seems to indicate that the diffusion of the phenol through the gauze is not absolutely uniform. By passing a current of steam through the gauze enclosed in a glass tube and condensing the vapour fairly good results are obtained, but the process is neither so simple nor so satisfactory as the one described. The presence of resin does not affect the results, as the resin gives off no volatile matter combining with bromine. An aqueous infusion of resin, on the other hand, does decolorise a small quantity of bromine.

The **President** proposed a vote of thanks to Dr. Thresh for his paper, and this being heartily accorded he rose again to introduce

An Eminent American Visitor,

in the person of Professor Prescott, of Michigan University, Ann Arbor, U.S.A., a member and late President of the American Pharmaceutical Association. Mr. Druce asked the Conference to extend to Professor Prescott a hearty welcome. He had only arrived in Dublin the day before, and could not join them in the earlier sessions of the meeting, but none the less heartily did they welcome him. (Loud applause.)

Professor **Prescott**: Mr. President, members of the British Pharmaceutical Conference, and fellow-members of the fraternity of pharmacy, it gives me very great pleasure to be present with you, and I desire to thank your President for this very kind introduction. Pharmacy is something which should bring its practitioners and votaries all over the world very near together. It is a bond of unity by reason of the science which it represents and requires and uses, and it is a bond of unity by reason of its benefit to humanity and the part that it takes in the preservation of human life. (Applause) I know that I am fully authorised to present the heartiest greetings of the American Pharmaceutical Association to this body as a sister national society—(loud applause)—and in so doing I offer the greetings and congratulations of the entire body of pharmacists in the United States. (Applause.) We are coming, Mr. President and friends, every year nearer and nearer together as English-speaking people. (Hear, hear.) Since I came to Great Britain a few weeks ago the thought has sometimes come into my mind, are we not in danger of losing that individuality upon which we have prided ourselves? (Laughter and applause.) I do not know but that we are to be swallowed up in those dominions beyond the seas—(laughter)—in which we all take such great pride. (Loud applause.) But we are very glad that we are brought nearer and nearer together. (Applause) I hope to be able to speak to many of you; to hear the voices of some of you during the day and during the remainder of the Session. It is my regret that I was not present yesterday, but I thank you again and return my very best thanks to your President for this very kind and favourable introduction. (Loud applause.)

Discussion on Standardisation.

Dr. **Attfield**, at 10.20 a.m., rose to resume the discussion on Mr. Martin's and Mr. Gadd's papers. He said that they had a most interesting paper from Mr. Martin on what they must term the principles which underlay the practice of the so-called standardisation of drugs; and from Mr. Gadd they had an important and practical paper on the same subject, both papers perfectly cogging in with each other, as the engineer would say. In the discussion that ensued some remarks were made as to the position of medical practitioners in relation to the long-worded subject of standardisation. He held the peculiar position of neither being a medical man nor engaged in the practice of pharmacy, but as Editor of the Pharmacopœia he might be considered to be in the position of an onlooker on this subject. Let them take any powerful drug they pleased which had made for itself a physiological therapeutical reputation. Its action might be different in different individuals, and even in the same individual at different times. They came to the time at which what was termed the active principle was discovered, but which was afterwards found to be only one active principle, though it might be the chief one. But as galenical preparations were still untrustworthy, and having got at one chief active principle as a matter of expediency and for temporary purposes, they fixed on that active principle, and they estimated its amount in the respective preparations. Even then, however, allowances had to be made, for, owing to variations in climate, temperature, &c., they found that the drug was not always the same; and so that uncertainty was reduced considerably by the expediency of standardisation. Time went on, and they saw that the whole of the active principles of the drug had been discovered—say two or three in number. Now the advanced physicians say, "We desire to have these active principles separated in order that we may administer one of them, whichever we please, in order that we shall be certain that its action will not be interfered with by the others. If it pleases us we will give two of them, or all three if necessary; we know what we are doing now, we did not know before." But when they had reached that period, where were they? Having found three distinct principles in the drug, were they to go on giving the mish-mash that was to be found in decoctions, infusions, tinctures, and extracts? The drug was no longer administered; the active principles were separated and at the disposal of the physician, and either singly or collectively he prescribed them. Now it would be evident that, if there were many drugs in the position of the drug that had been sketched, galenical pharmacy must come to an end. ("Hear, hear" from Mr. Martin.) One of those who read a paper said "hear, hear" to that. (Laughter.) He ventured to say that Professor Prescott would admit it was known in the United States, and on the Continent it was known, that there was a general feeling in favour of a uniform strength for drugs. He quoted the opinions of MM. Collen, Petit, and Ranwitz at the 1897 International Pharmaceutical Congress in Brussels.

Mr. **Patrick Kelly**, referring to tincture of opium, told how he had a 15-per-cent. opium, and of that only 1 oz. was necessary for 1 pint of tincture, which had not the physical characters that a tincture from a 10-per-cent. opium has. He was decidedly opposed to the idea that alkaloids represented the full active constituents of a drug. A cup of tea without sugar or milk was to a lady exactly what an alkaloid was without the other substances. (Laughter.)

Mr. **Naylor** said that in all cases when an alkaloid was given, or a certain percentage of solid matter had to be determined, the physical conditions ought always to be stated.

Mr. J. C. **Umney** said that the great difficulty from the pure wholesaler's point of view in this matter was the effect of climate, soil, &c, on the drug, and it was extremely difficult to make preparations which would be at all times the same. Especially was it difficult for the wholesale worker on the large scale to get preparations which would exactly tally with those made on the small scale. It was absolutely impossible to get belladonna-root at all times of the year that was identical with ratios of extractives and alkaloids. Until they got top and bottom limits for alkaloid, and a narrow limit for collection, standardisation would not be perfect.

Professor **Prescott** said standardisation was a very interesting and enticing subject, and one that had occupied much time at pharmaceutical meetings in the United States. It was certainly true that all the experimentation in physiological pharmacology — the determination of the effects of drugs and medicines—had been quite largely (not wholly) confined to the determination of the effects of chemical individuals—distinct chemical compounds. The results from these had been of great value, in the first place, regarding the leading effects of vegetable drugs; they were only approximately certain, and they must never forget, as had been brought out in that discussion, that in any vegetable drug there were a great number of chemical individuals which modified the effect of the whole. (Hear, hear.) As the harmony of a piece of music was not dependent upon a single tone, as any desirable colour which pleased the eye was not dependent upon the primary element of colour, so it was that the best effects of medicines were not obtained by single constituents, but by the harmony of the constituents acting with each other as provided by Nature itself. (Applause.) He hoped that more and more experimental pharmacology would be used in defining the physiological effects of these drugs upon animals and man, so that there might be a limitation in the possibilities of standardisation as they understood it. It still remained true that the definition of any drug was dependent largely upon chemistry as to what it contained. It required chemistry to define the constituents of a drug, and what was called standardisation was to give this definition in chemical terms—a definition as to what Nature has done first, and what primary chemical individuals were brought together into the bolus of the vegetable drug as it stood. (Hear, hear.) Let them hope that no efforts would be relaxed in chemical investigation and standardisation. There was no danger that too much would be done in this direction; but there might be danger in this—that too much dependence would be placed upon incomplete results. (Applause.)

Mr. J. **Rutherford Hill** thought Dr. Attfield had given play to his imagination. Professor Prescott, in his remarks, described the situation accurately, and it was that they had to deal with. Standardisation was good, and the condition of things since that method was introduced was an immense improvement on what previously existed, and the effect was to greatly improve the quality of drugs generally. Dr. McWalter had stated that in the preparation of digitalis no advance had been made for 100 years. He (Mr. Hill) told the meeting of a case in Edinburgh where an inactive preparation made from yellow leaves had upset a doctor, and a tincture from a beautiful green leaf had cured the patient. He agreed with Dr. McWalter that the present method tended to throw the manufacture of galenicals into the hands of large makers, and that was a great disadvantage to practical pharmacy, while the individual pharmacist became little more than an intelligent distributing-machine. (Applause.) He also referred to the deterioration of fluid extract of ipecacuanha, and the "faking" of commercial extracts.

Mr. **Martin**, replying on the whole debate, said they knew from practical experience that medical men obtained effects from the old-fashioned tinctures that they could not get from, say, quinine and strychnine. They must therefore continue to make these. The whole gist of his paper was that pharmacists should make true galenical preparations. Their description of the drug also should be more accurate and more careful than it is. He was glad Mr. Bird had made this investigation into belladonna; it was very useful. Professor Prescott struck the very natural and very right interpretation of the subject in his reference to music. (Hear, hear.) Mr. Martin concluded by sarcastically remarking *à propos* of standardising enthusiasts, "Let science advance if galenical pharmacy disappears from the face of the earth." (Laughter and applause).

Mr. H. **Gadd** also replied, expressing the hope that drugs would be standardised at the port of arrival and sold in parcels according to the exact standard at which they had been assayed. (Applause.)

Thanks were accorded to the authors, and Mr. **Thomas Tyrer** then read the three following papers:—

Distillation and Boiling-points.

By **Thomas Tyrer**, F.I.C., F.C.S., and **Charles T. Tyrer**.

As the result of a difference of opinion as to the distilling-points of a sample of petroleum ether the following experiment was made, to ascertain what differences the position of thermometer made:—

A $\frac{1}{2}$-litre flask, A, was made with five openings for thermometers, so arranged that No. 1 was $\frac{1}{2}$ inch above the liquid; No. 2, $1\frac{1}{2}$ inch above the liquid; No. 3, in the neck of flask; No. 4, in neck of flask just opposite the exit; No. 5, about 1 inch in the exit-tube. The thermometers were carefully compared and checked. The observers took the readings as nearly simultaneously as possible. The rate of distillation was as nearly as possible 25 drops per minute; when, however, $\frac{1}{10}$ was left the drops were 8 per minute, when $\frac{1}{20}$ was left very little came over, although the liquid was boiling violently. 250 c.c. were taken. The sample should have boiled "all under or at 60° C." The flask was placed on a water-bath fitted with a gas regulator. The following are some of the readings in degrees Centigrade:—

Temp. of bath	No. 1	No. 2	No. 3	No. 4	No. 5
57	35	34	32	33	33·5
57	38·5	36·2	36	35·8	36·2
57	42·5	41	41	40	40·7
57	44·5	43·4	43	42	41·7
58·8	46	45	44·8	43	43
58·8	48	47	45	43·2	43
58·8	48·5	48	46	44	43
60·4	51·5	51	46	44·5	43·2
60·4	55	54	46·1	43·2	41
62·4	55	56	46	42	39·2
65·9	57	60	46	40	30·5
69·2	59	60	51	43	30·8
69	60	60·8	53	43	31
69	61	62	57	51	34

From the above it will be noted that the position of the thermometer has a marked influence on the result of observations. In the case of liquids fractioning at higher temperatures than the above, the difference is still more marked.

In the case of terebene fractionations with the apparatus marked B, the difference in readings of points marked 1 and 2 were as follows:—

No. 1 ...	155°	155·5°	157°	157·7°
No. 2 ...	157·5°	158·4°	159·8°	160·3°

With apparatus marked C the readings at points marked 1 and 2 were:—

No. 1 ...	160°	162°	162·5°	163°
No. 2 ...	161·1°	163·2°	163·9°	164·8°

The readings were also affected by exposure of the neck of flask to air-currents.

The apparatus marked D, in which the thermometer is sealed in the neck, and which is protected by an air jacket, gave appreciable difference against a similar flask unprotected. The following differences were observed, the experiments being carried on as nearly as possible on the same lines:—

Protected ...	157°	157·5°	158°	158·5°
Unprotected ...	156·8°	157·3°	157°	158·4°

Whilst the readings of the protected apparatus were steady, those of the unprotected apparatus were fluctuating.

The authors conclude that in taking fractionations with a flask and not using a column, a bath should be used where possible, the temperature of which should be about 10° C., and not more than 15° C., above the highest distillation-point of the liquid under examination. Where a bath is not used, the upper part of the flask should be protected from hot-air currents by an asbestos disc, the burner being carefully regulated and the liquid not boiled violently. Where possible an apparatus should be used in which the thermometer is entirely emerged in the vapours, and the bulb of the thermometer should be just in the neck of the exit-tube, and not opposite it, as this latter is the point at which the vapour comes over.

Where a fractionating column is used they have found good results from the apparatus E, devised with the co-operation of Mr. Wertheimer. The constrictions in the lower tubes have the effect of producing a slight cooling by expansion when the vapour is released. The reading is taken just in the exit-tube.

The next point considered was how far variations in construction of apparatus influence observed boiling-points. All kinds of apparatus gave high and variable results unless the upper portions of the tubes or flasks were protected from hot-air currents from the burner by an asbestos disc 12 inches diameter, with a hole in the centre, so that only the base of the tube or flask was exposed to the direct heat of the flame. The following experiments were performed with the apparatus shown, and all protected with an asbestos disc, on pure air-free distilled water. In each case the thermometer was placed 1 inch above the surface of the liquid, which was kept boiling steadily. Seven thermometric readings are given of each experiment, taken at intervals of 30 seconds. The outside thermometers were placed ¼ inch away from the sides:—

F. 1. A test-tube, 5 inches by ⅝ inch. A thermometer was placed adjacent to the emergent portion of the recording thermometer, and another at the side of the tube, the three simultaneous readings are given (these and all others are in degrees Centigrade):—

a	*b*	*c*
99·8	31	61
99·9	34	72
100	40	71
99·9	39	75
99·9	38	81
100	35	84·5
99·9	36	83

F. 2. A boiling-tube, 7 inches by 1¼ inch, conditions as above:—

a	*b*	*c*
99·8	41	72·5
99·9	47	74·5
99·9	49	77
99·9	48	77·5
99·9	51	80·5
99·8	52	80
99·8	50	81

F. 3. A tube, 12½ inches by 1 inch, of sufficient length to include the whole thermometer-stem. A thermometer was placed adjacent to side of tube:—

a	*b*
99·9	79
100	79·5
100·1	80·5

F. 4. An ordinary tube 10-oz. distilling flask, ¾-inch neck and ¼-inch exit. A thermometer was placed at side of flask:—

a	*b*
100·4	84
100·3	85
100·3	84·5

F. 5. A flask as above, but with ¾-inch exit:—

a	*b*
100·2	60
100·3	58
100·3	59

F. 6. A long-necked flask (1 litre) with open top (neck, 15 inches by 1 inch), the thermometer hung in the neck. Temperature at side of flask taken:—

a	*b*
100·1	75
100·2	75·5
100·2	76·5
100·1	77
100·3	77·5

F. 7. Distilling flask with the neck protected by a vacuum jacket. Size as No. 4. Temperature at side taken.

a	*b*
100	77·5
100·3	77·5
100·3	77·6
100·2	77·6

F. 8. Distilling-flask, same as No. 7, but with air jacket instead of vacuum jacket. Outside temperature taken:—

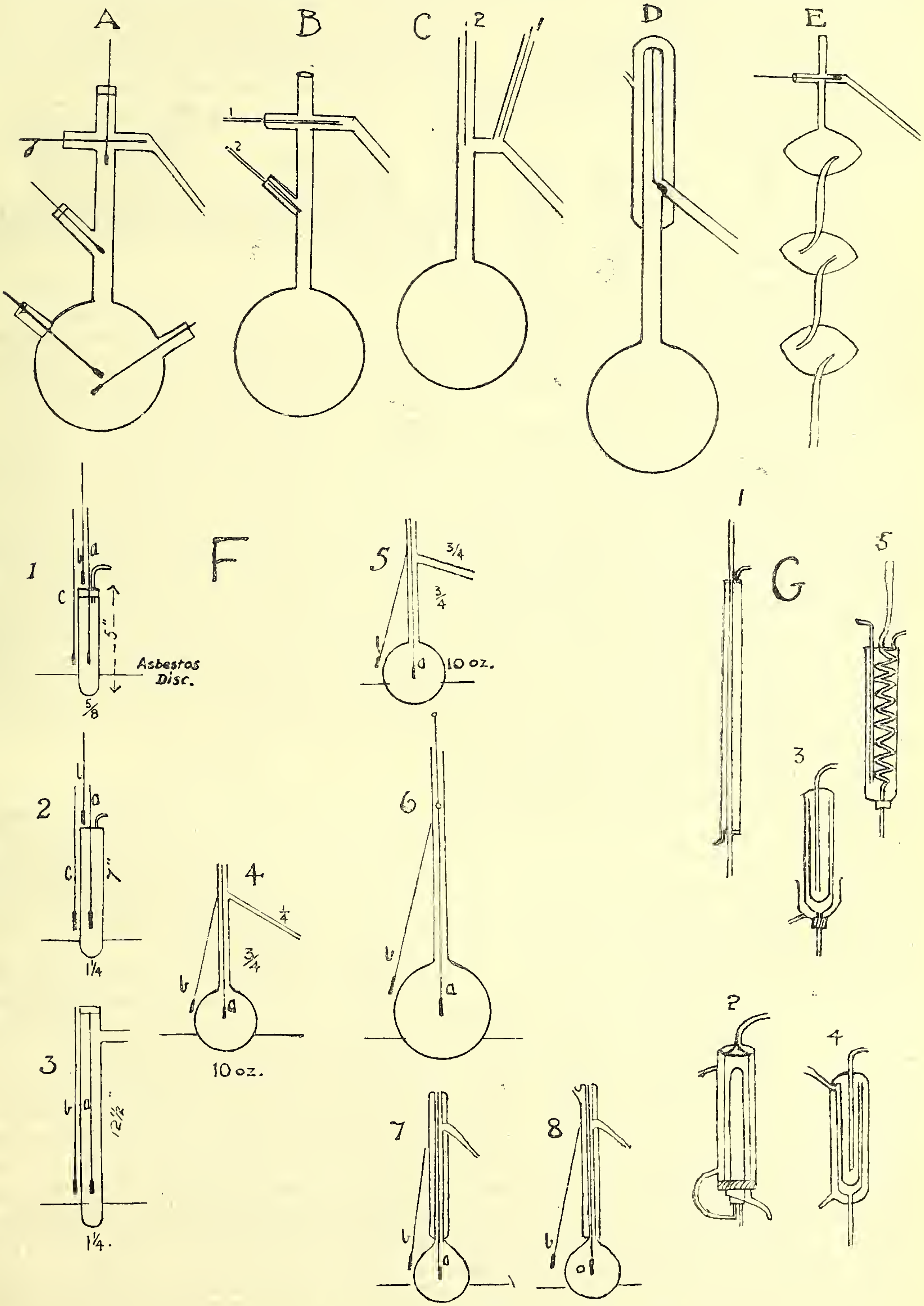
a	*b*
100.2	77
100·3	77
100·4	77

F. 9. A tube 14 inches by 1 inch, with ⅝-inch exit, so arranged that the vapour generated passes through a jacket. Outside temperature taken:—

a	*b*	*a*	*b*
100·4	53.5	100·5	62
100·5	54	100·5	61·2
100·5	59	100·6	69

All the above experiments were made without condensers attached. The results show comparatively small differences between the different methods. The lowest reading being 99·8 for the 7 inches by 1¼ inch boiling-tube, jacketed vapour tube gave the highest results. The authors favour the use of a tube long enough to include the whole of the thermometer as in experiment No. 3, with asbestos disc-protector.

It has been stated that the use of various condensers would variously affect the boiling-point determination. To



Fractionating Apparatus (referred to on previous page).

test this they experimented with the five condensers figured. The condensed water flowed at the rate of 1 pint in two minutes. The tube No. 3 was used:—

G. 1. Ordinary condenser 2 feet 7 inches by $\frac{1}{2}$ inch.
G. 2. Thresh-Binet condenser, 6$\frac{3}{4}$ inches by 1$\frac{1}{2}$ inch.
G. 3. Cripps condenser, 6 inches by 1 inch.
G. 4. Enclosed Cripps condenser, 7$\frac{1}{2}$ inches by 1$\frac{3}{4}$ inch.
G. 5. Worm condenser, 12 inches by 3 inches, containing 23 inches $\frac{3}{8}$-inch glass coil.

The following are results:—

G. 1	G. 2	G. 3	G. 4	G. 5
100·1	100	99·9	99·9	100
100·2	100	99·9	99·9	100·2
100·1	100	99·9	100	100
100·1	99·9	100	99·9	100·1
100·2	99·9	99·9	100·1	100·1
100·1	100	99·9	100	100·1

The greatest difference is 0·2° C., due, possibly, to slight partial vacuum formed by condensation. We conclude that the effect of condensers upon the boiling-point is almost a negligable quantity, and certainly would not affect pharmaceutical determinations. They recommend that in any future edition of the Pharmacopœia, definite instructions should be given as to apparatus used and conditions for fractionation and boiling-point determinations.

Estimation of Mercury and Bismuth Salts.

By Thomas Tyrer and C. T. Tyrer.

The authors have used the hypophosphorous acid method for the determinations of mercury in salts for several years. They dissolve 3 to 5 grammes of the substance in hydrochloric acid; filter the solution, if necessary, and add caustic soda solution until a permanent precipitate is just formed, when hypophosphorous acid is added. A white precipitate is formed, which turns black by boiling. After cooling, the black precipitate is collected on a tared double Swedish dense paper, washed with water, drenched with alcohol, then ether, and dried in an air-bath maintained at 98° C. by means of a thermostat. It is advisable to heat the beakers on a plate to prevent bumping, and they should be of such a size as to prevent loss by spurting. The method gives satisfactory results.

Stannous chloride rapidly and completely reduces salts of mercury from acid solutions. The precipitate is so fine that it is impossible to prevent loss of mercury on filtering.

Formaldehyde, in acid solutions, hot or cold, only partially reduces to calomel. With excess of alkali the reduction is slow, and the precipitate so fine that loss occurs as with stannous chloride.

Phenylhydrazine hydrochloride does not reduce in acid solution, and in presence of alkali reduction to calomel is incomplete.

Sodium arsenite is slow and incomplete in acid solution, but complete in presence of alkali.

Tartar emetic in strongly alkaline solution reduces the salts, but the product is contaminated with mercury suboxide, and traces of an antimony salt.

The following are some average results obtained:—

—	Ac. Hypophos.	Stannous Chlor.	Formaldehyde	Arsenite of Soda
Hyd. ammon. chlor.	76·9	75·81	76·32	76·53
Hyd. perchlor. ...	73·61	72·86	73·42	72·92
Hyd. ox. rub. ...	91·7	91·17	91·37	91·45

Phosphorous acid in excess also reduces to calomel, but is not very satisfactory. A modification of the method by Vanine and Treubert in *Ber.* (2), 129, 130 (*J.S.C.I.*, 4, xvii., 399) gives fair results.

Reduction of Bismuth Salts.—The authors find that hypophosphorous acid and formaldehyde work well with bismuth salts. The best method of procedure is to dissolve the salt in as small a quantity of hydrochloric acid as possible, filter, if necessary, through glass-wool, washing the wool with warm hydrochloric acid; then add sodium-hydrate solution to neutralisation, add a slight excess of hypophosphorous acid, or a considerable excess of formaldehyde, and boil until reduction is complete. Wash by decantation with distilled water, place on a tared filter, and wash rapidly with alcohol, and finally with ether. The filter-paper containing the reduced metal should be compressed and tightly folded to prevent undue access of air, as the metal is in such a fine state of division that it easily oxidises. This possibly accounts for the high results obtained.

		Hypophosphorous acid	Formaldehyde	B.P. sulphide method
Bismuth subnitrate	...	71·65	72·2	71·52
Bismuth subcarbonate	...	81·26	81·31	80·93
Bismuth salicylate...	...	60·19	60·34	59·76

Hypophosphorous acid is preferable to formaldehyde, as besides the objectionable odour of the latter, considerable bumping occurs with it. Neither method has any advantage over the B.P. one.

Effect of Glassware Containers on Acids.

By Thomas Tyrer and C. T. Tyrer.

Samples of pure sulphuric acid (sp. gr. 1·843), pure hydrochloric acid (sp. gr. 1·160), pure nitric acid (sp. gr. 1·420), and pure hydrobromic acid (sp. gr. 1·077), which showed an inappreciable residue on evaporation, were put into green, white, amber, and blue glass w.q. bottles, and allowed to stand for seven months in diffused light on a laboratory shelf, in order to test whether there was any action on the glass. None of the acids showed appreciable or increased residue, or traces of iron, lead, or manganese, nor was there any colouration. The sulphuric, nitric, and hydrobromic acids were free from arsenic. The hydrochloric acid showed a faint trace—approximately 1 in 2,000,000. This proves that these acids suffered no appreciable deterioration by keeping in ordinary glass vessels. Hydrochloric and sulphuric acids acquired a faint trace of arsenic after some days' heating with finely powdered glass of each kind. In connection with the testing of sulphuric acid for arsenic by the Marsh-Berzelius test, it is worth noting that a very faint trace of arsenic may not be indicated; but on the addition of some pure arsenic-free hydrochloric acid a trace may become apparent, proving that the delicacy of the test is enhanced in the presence of hydrochloric acid. Mr. F. Gosling assisted in this work.

The authors were cordially thanked. The next paper was on

Hydrastin.

By Thomas Maben, F.C.S.

The latest edition of the B.P.C. Formulary semi-officially recognises hydrastin. Previously no authoritative process had been published for the preparation of hydrastin, and it has, as a rule, been imported from America. There has all along been considerable doubt as to its actual composition, although most authorities incline to the belief that it consists mainly of impure hydrochloride of berberine, and recent examination of a number of trade-specimens proves that the drug varies very much in quality.

Hydrastin is obtained from the rhizome of *Hydrastis Canadensis*, and is essentially a mixture of the alkaloids occurring in that plant. The alkaloid first isolated from hydrastis was one of deep yellow colour, and Rafinesque in 1828 applied to this the designation "hydrastine." In 1830 Buchner and Herberge gave the name "berberine" to the yellow substance isolated from *Berberis vulgaris*. As the yellow body in hydrastis was later found to be identical with the berberine of Buchner and Herberge, and furthermore, as the white alkaloid of hydrastis was found to be of greater therapeutic value, and peculiar to hydrastis, whereas the yellow one was not, common usage generally adopted the term "hydrastine" for the white alkaloid, and transferred the name "berberine" to the yellow alkaloid.

Hydrastine, when pure, is in colourless crystals; but, owing to numerous fractures, they are usually white and opaque. It is readily soluble in alcohol and in chloroform, also in ether, but only sparingly in water. Sayre directs it to be made by percolating with water, precipitating the berberine by hydrochloric acid, and adding ammonia to the filtrate, from which the impure hydrastine is then deposited. This method presupposes the hydrastine to be in combination with vegetable acids and thus soluble in water, but it is of no practical value whatever, as the yield would be only a fraction of the total alkaloid.

Berberine, which is widely distributed in nature, being found in at least three natural orders, occurs in orange-yellow acicular crystals. It is soluble in about 300 parts cold water, more so in hot; practically insoluble in ether and chloroform, though the latter removes traces from acid solutions. The neutral sulphate is very soluble in water.

Both the alkaloids are bitter, but their therapeutic properties are quite distinct. Hydrastine is much the more powerful of the two, the dose being from ¼ to ½-gr., whereas berberine is given in doses from 1 to 4 gr.

The two alkaloids occur in the rhizome, on the average, in the proportion of about 2 per cent of hydrastine and about 3⅓ per cent. of berberine, but the results of the assays of thousands of pounds of hydrastis proves that the percentage of both alkaloids varies very greatly. The following figures quoted from laboratory records of assays of the drug; the first series were assayed both for hydrastine and berberine, and the second only for hydrastine.

Hydrastine	Berberine	Hydrastine	Berberine
1·18	3·0	2·5	3·13
1·9	3·0	2·8	4·15
1·7	2·7	2·32	3·24
1·7	3·0	2·7	3·48
1·6	2·55	2·0	3·3
1·6	3·5	2·1	3·1
2·0	3·9	2·6	3·0
1·8	3·6	2·0	3·0
2·05	3·3	2·33	2·22
2·8	4·06	mean 2·09	3·38

For hydrastine alone: 2·43; 2·43; 2·3; 2·4; 2·57; 2·75; 3·0; 2·75; 2·52; 1·89; 2·53; 1·66; 252; 1·69; 1·6; 2·51; 2·4; 1·18; 2·35; mean, 2·28.

The average percentage of the entire series, therefore, works out at 2·18 for hydrastine, and, based on this, 2 per cent. has been adopted in America, unofficially, as the standard for hydrastis, the amount of berberine not being taken into consideration at all. The same standard has been adopted in the new German Pharmacopœia—namely, a minimum potency of 2 per cent. of hydrastine for the extractum hydrastis fluidum. Merck's recent criticism that this figure is "somewhat excessive" is unwarranted, when we consider that it is really under, rather than over, the average.

The processes that experience has proved to be the most satisfactory in the assay of hydrastis are as follows:—

Exhaust 10 grammes of the fine ground drug by extraction with hot alcohol, either in a Soxhlet tube or in a flask with an upright condenser. Cool the percolate and adjust to 100 c.c. by the addition of alcohol.

BERBERINE (yellow alkaloid).

Put 25 c.c. of the above percolate in a wide-mouth flask of about 8-oz. capacity; add 1½ c.c. of hydrochloric acid (32 per cent.), ¼ c.c. of concentrated sulphuric acid, and 125 c.c. of sulphuric ether. Cool; shake well, and allow the mixture to stand twenty-four hours in a refrigerator, and the crystals of berberine hydrochloride will separate. Filter through a tared paper, and preserve the filtrate. Wash the crystals with a mixture of equal volumes of alcohol and ether until the washings cease to give an acid reaction. Add the washings to the filtrate preserved as above directed. Dry the crystals at 105° C., and weigh. The result multiplied by 0·9017 gives the berberine. This multiplied by 4 is equivalent to the berberine in 10 grammes of the drug.

HYDRASTINE (white alkaloid).

Render the combined filtrate and washings from berberine above very nearly neutral or only faintly acid. Evaporate nearly to dryness on steam bath; treat the residue with hot water in small quantities, filtering same into a stoppered separating funnel until the washings from the residue cease to give an alkaloidal reaction with the ordinary test reagents. (The extraction of the alkaloid from the resinous mass left after the evaporation of the combined filtrate and washings may be somewhat expedited at this point by the addition of a few drops of alcohol at each extraction with water, evaporating off the alcohol each time before the aqueous washing is poured off.) Add to the aqueous extract in the separating funnel q.s. ammonia water to render alkaline, and extract hydrastine alkaloid by agitation with ether. Continue the extraction with ether until the hydrastine is entirely removed; evaporate off the excess of ether, and re-extract the hydrastine by means of several portions of 5-per-cent. sulphuric acid, and from the combined acid-washings extract the hydrastine again by shaking with several portions of ether, after having rendered the solution alkaline with ammonia. Finally, evaporate off the ether, dissolve the hydrastine in an excess of $\frac{n}{20}$ acid, titrating back the excess with $\frac{n}{100}$ alkali in the usual manner, using cochineal as an indicator. The result multiplied by the factor 0·00383, and this by 4, gives the hydrastine in 10 grammes of the drug.

In determining hydrastine alone the drug can be extracted, and the berberine precipitate, as above indicated, discarded, the hydrastine being determined by the remaining part of the process.

Where the concentration or extract is assayed instead of the drug, the same process can be used, it only being necessary to substitute extract or concentration equivalent in hydrastine content to drug.

The author also described a shorter method, viz.:—

Weigh out ½ gramme of the concentration, place in a beaker, add 60-per-cent. alcohol q.s. to dissolve the greater portion of it. Distribute this alcoholic solution upon about 2 ounces of well-washed saw-dust or other inert material, contained in a dish, rinsing out the beaker with successive small portions of 60-per-cent. alcohol, which also transfer to the material. Place the dish in a warm place, and allow to stand until the alcohol is practically all evaporated, so as to leave a dry powder, which transfer to an 8-oz. flask, add 150 c.c. of sulphuric ether, water q.s. to moisten the mass, and solution of ammonia to render alkaline. Cork tightly, and shake at intervals during five hours. Allow to settle, decant 75 c.c. of the clear ethereal solution into a stoppered separating funnel, and extract the hydrastin by shaking with several portions of 2-per-cent. hydrochloric acid. Collect the acid washings in a second separating funnel, rendered alkaline by the addition of ammonia-water, and agitate with several portions of sulphuric ether until all the hydrastin is removed. Evaporate the ether, dissolve the hydrastin remaining in a sufficient quantity of $\frac{n}{20}$ acid, titrate back with $\frac{n}{100}$ alkali, and proceed as in the latter part of the process above given for the assay of the drug.

The author then told the meeting what authorities, such as Squire, Sayre, and Martindale, say about the composition of hydrastin, and stated that an examination of samples of American hydrastin recently purchased in the open market revealed an astonishing variation in the hydrastine content.

Referring to the B.P.C. Formulary process, he regretted that the product does not represent the better grades of hydrastin that pharmacists have been accustomed to dispense, and physicians to prescribe. The process is as follows:—

Hydrastis rhizome, No. 60 powder	1 lb.
Alcohol (60-per cent.)	q.s.

Moisten the rhizome with 8 fl. oz. of the alcohol; pack in a percolator, gradually pour on more of the alcohol till the hydrastis is exhausted, collect the liquid, and remove the alcohol by distillation; evaporate the residue to dryness, and reduce to a fine powder. Transfer immediately to a well-closed bottle.

Dose: ½ to 2 gr.

Although he has not tried this process, but from experience he said the process is not sufficient to exhaust the hydrastis, and the probabilities are that the preparation will contain much less white alkaloid than 10 per cent. Further, not only will the extractive be deficient in alkaloid, but, owing to the weak alcoholic menstruum, it will be hygroscopic, and unless care be taken to guard against atmospheric influences, the powdered extract will by and by relapse into a sticky, semi-solid, gum-resinous mass.

He had examined samples of commercial hydrastin as to their alkaloidal content. Of these, four were American, one was B.P.C., manufactured by a reliable firm, and one from an unknown source. One was said to contain 20 per cent. of hydrastin, another "the combined alkaloids from golden seal in the same proportion as they exist in the drug, but in ten times the concentration," and no claim was made for any of the others. In appearance three of the samples were of a bright yellow colour, in fine powder, and perfectly non-hygroscopic. Two, including the B.P.C. sample, were in coarser powder, hygroscopic, and darker. One was darker in colour and non-hygroscopic.

Estimating the alkaloids by the processes already given, the following results were obtained:—

	1	2	3	4	5	6 (B.P.C.)
Hydrastine ...	15·2	8·7	trace	trace	trace	trace
Berberine ...	23·56	9·67	26·9	16·53	trace	trace

From these figures, which the author considered to be low, it is clear there is a marked difference between the various preparations sold as hydrastin. The author concluded by expressing disappointment with the Formulary process, protested against the assumption of the name of a drug of recognised character in the country of its origin to an inferior preparation, and suggested that in the next issue of the Formulary the name be changed to "extractum hydrastis siccum," that a stronger alcoholic menstruum be employed, and that the extract be standardised to contain 10 per cent. of hydrastine (white alkaloid). The author acknowledged receipt of valuable information from Dr. Francis, of the pharmaceutical laboratory of Parke, Davis & Co., Detroit.

Mr. Martin, as Chairman of the Formulary Committee, said the facts would be carefully considered. He also took the opportunity to suggest that when the B.P. authorities annex anything from the Formulary they should retain the name by which it has been known, or at least use it as a synonym. He instanced the case of elixir of cascara sagrada, the identity of which is now hidden under the name of "syrup."

At the request of the author, the following paper was taken as read:—

The Properties of Ergot.

By J. C. McWalter, F.F.P.S. (Glasgow).

The pharmacy of ergot is a reproach to British chemists. Yet few drugs have such a definite physiological action. The B.P. fluid extract is a wretched product, which should be removed from its pages. Ergotin is a creditable scientific preparation of definite physiological action and tolerably uniform strength. It is now believed that "ergotin" should be regarded as a collective term which comprises most of the active principles of ergot *minus* the oil, resin, sphacelinic acid and sclererythrin. The problem for pharmacy is to reduce this to a more definite active principle, or at least to produce it of a still more definite weight and consistence. The Pharmacopœia product differs from Boujean's in that the drug is extracted with weak alcohol and the resulting extract treated with water. Further, the weak alcoholic extract from which the B.P. extract is now made, is practically the tincture of ergot of the old Dublin Pharmacopœia, which was generally regarded as a miracle of inertness. The oil now regarded as worthless was regarded by Dr. Wright as the active principle of ergot, the extraction of the oleaginous substance being best done by an alkali. The ammoniated tincture is a survival of this idea. The infusion is comparatively worthless, although a fresh infusion made from freshly bruised and fresh ergot probably contains a larger proportion of the alkaloid than the equivalent of the tincture in the fluid-extract process. It is not, however, proved that the alkaloid is a definite measure of the potency of ergot. Except for this preparation, the proportion of solid extract in honestly made fluid-preparations of ergot may be regarded as a rough mark of their potency. Boujean fluid to 500 parts of ergot yielded 10 to 14 per cent. of ergotin. The present fluid extract varies in yield from 11 to 16 per cent., and the tincture from 3 to 3·5 per cent. Squibb's extract yields about 11 per cent. Kobert says that cornutine is the active constituent, and is contained in the alcoholic extract with sphacelinic acid after removal of the fat. He also points out that all aqueous extracts go bad after nine months, due to the decomposition of the cornutine. The author has, however, found that extracts with a distinct fœtid odour still have a marked action on the fibrous tissue of the blood-vessels and capillaries, which seems to indicate that cornutine is not the sole active constituent. Trimethylamine, mentioned as the source of odour of ergot, is probably a decomposition product nearly absent in the so-called aseptic ergot. A fluid extract can be made by dissolving 1 pint of ext. ergotæ in 1 of glycerin, and sufficient distilled water to produce 5 parts. The product is about 5 per cent. stronger than a well-made liquid extract (B.P.), and altogether more reliable. It is also rather palatable—an important item The elaborate methods adopted by certain American manufacturers of assaying ergot by the physiological action on a cock's comb are based on a completely erroneous assumption that the principle which causes the contraction of the unstriped tissue of the blood-vessels is the active ingredient. The human factor is also quite lost sight of. The fact is there are two distinctly physiologically active principles—the one probably cornutine, which produces the rhythmic contraction of the uterus, and the other sphacelinic acid, sphacelotoxin, and some other principle, or combination of principles, which produce contraction of the fibrous tissue of the capillaries and are responsible for the employment of ergot in hæmorrhage. Many different preparations produce definite uterine contractions, but to produce definite effects in uterine hæmorrhage is not so certain. This, according to the author, is due to several reasons. The conclusions of the author were that—

(1) Ergot has at least two distinct actions, and preparations should be made possessing one or other of these properties in the most active degree.

(2) Ergot comprises a number of distinct chemical substances, but so few can be recognised as definite entities, and so many different names have been applied to them, that it is premature to decide whether cornutine or any other alkaloid is the active principle.

(3) The extract ergotæ of the B.P. is a fairly satisfactory product, but ought to be regulated to a definite consistency. The fluid extract is a poor article, and a much better solution can be obtained by dissolving 1 part of the extract and 1 of glycerin in a sufficiency of water to make 5 parts.

(4) The ammoniated tincture has a moderately effective action in constricting the capillaries, but is not suitable for obstetric work, being weak, bulky, bitter, and nauseous.

(5) When fresh ergot is bruised, and an infusion made and drunk immediately, the active principles are obtained in as great proportion as in the most elaborate extracts, but infusions made from old ergot, or ergot powdered for a week, or concentrated infusions, are a disgrace to pharmacy.

(6) Trimethylamine is a decomposition product, and its presence denotes a deterioration of the sample.

Next followed

Concentrated Liquors.

By F. C. J. Bird.

Of the ten official concentrated liquors three only—viz., cusparia, quassia, and serpentaria, can be considered quite satisfactory in respect of uniformity of composition and freedom from deposit on keeping. Copious precipitation is the chief characteristic of the others. In some cases this goes on for a certain time, only the liquid afterwards remaining permanently bright, whilst in others deposition takes place for an almost indefinite period, thus affecting the physical characters and possibly the activity of the preparation. It seems desirable, therefore, to ascertain by experiment if these faults are inseparable from the formulæ, or if, by amendment or modification of the latter, they can be so corrected that products may be obtained from them which shall always be uniform in composition and capable of keeping unchanged for any reasonable length of time.

LIQUOR CALUMBÆ CONC.

At the last meeting of the Conference in Ireland it was stated in reference to this formula that the "characters of the product would depend entirely on the power of the press." This statement has since been confirmed by Mr. A. C. Abraham. Loss of extractive therefore follows both from the diminished amount in the pressings and the larger quantity precipitated by the spirit; there is also much loss of alcohol owing to the greater alcoholic strength of the liquid absorbed by the filter-paper and the more voluminous precipitate. There is no compensation for this in the official process, as the deficiency of volume is directed to be made up by addition of water to the filtrate.

The formula for liq. calumbæ conc. is one which furnishes a preparation varying greatly, according to the conditions of manufacture, both in extractive and percentage of alcohol, a low proportion of the latter bringing in its train a continuous deposition of sediment from the development of acidity in the liquid. It has been shown that this liquor prepared on the retail and manufacturing scales may possess widely varying characters, and whilst this formula exists in the Pharmacopœia it is possible that injustice may be done and the conscientiously prepared article of the small operator or retail pharmacist suffer unfair condemnation. The desideratum in every official formula is that it should furnish a uniform product under every condition of manufacture.

The modifications of the official process for liq. calumbæ conc. which I venture to suggest are the following:—(1) The substitution of chloroform water for distilled water, in order to prevent incipient fermentation. A fresh aqueous infusion of calumba is neutral in reaction; even slight acidity causes turbidity and slow precipitation in the finished concentrated liquor. (2) the use of a quantity of chloroform-water for the second maceration, equal to the difference between the volume of the first pressings and 16 fl. oz. (in the B.P. formula), so that the mixed expressed liquids may measure 16 fl. oz. (3) The removal of suspended matters, starch, &c. (often very considerable in amount), by allowing the mixed liquors to remain at rest for twelve hours, decanting the clear portion and washing the sediment with a little chloroform water. (4) The raising of the temperature ordered in the B.P. from 180° to 212°, starch being absent, the liquid after heating being quickly cooled and made up with boiled distilled water to 16 fl. oz. before the addition of the spirit.

On setting aside to clear, decanting, and filtering through a small filter, a finished product of 20 fl. oz. can be obtained without difficulty. Operating on clear liquor only in the process but little precipitation is produced by the spirit, and loss of alcohol is reduced to a minimum. If a higher temperature is used the final liquor filters more readily, is brighter, and keeps better.

The figures given below relate to two samples of liquor calumbæ conc. prepared in accordance with the above suggestions, the one (A) being heated to 180° F., as the B.P. directs, and the other (B) to 212° F.

The calumba root used yielded (by the aliquot part method):—

Aqueous extractive	14·4 per cent. w/v.
Alcoholic (20-per-cent.) extractive	13·2 per cent. w/v.

A.

	Sp. gr.	Extractive	Extractive removed from drug
Clear expressed liquid (16 fl. oz.)	1·215	4·8 per cent. w/v.	= 7·7 per cent.
Finished liquor ...	0·9914	3·7 per cent.	= 7·4 per cent.

B.

Finished liquor ...	0·9914	3·7 per cent.	= 7·4 per cent.

It will be noticed that whilst the total extractive obtainable from the calumba root itself by 20-per-cent alcohol was 13·2 per cent, the official liquor had removed but 7·4 per cent., and as shown by Abraham, if prepared with the aid of a hand-press, this proportion might fall as low as about 4·3 per cent., or about one-third the available soluble matter.

Fair uniformity may be expected in this liquor when the foregoing suggestions are adopted—the result is certainly not the unsightly product usually credited to the B.P. formula. But to bring this liquor into line with the others, in the processes for which more complete exhaustion of the drug appears to be aimed at, a better method than maceration-pressure must be employed for the extraction of the calumba-root. Slow percolation with chloroform-water is much more effective, but it must be noted that from a given sample of drug the "concentrated liquor" will be nearly half as strong again as a similar preparation by the official process. The root in No. 5 powder, as free from dust as possible, should be macerated with an equal weight of chloroform-water, packed lightly in a percolator, and (with B.P. quantities) percolation continued with chloroform-water to 16 fl. oz., the remainder of the process being continued according to the suggestions already given. The percolate should pass through layers of lint and sand at the orifice of the percolator, so that it may come off bright and free from sediment. A sample of liquor calumbæ conc. made by percolation gave the following figures:—

Calumba-root used Extractive (aqueous) 14·4 per cent.
Extractive (alcoholic 20 per cent.) 13·2 per cent.

	Sp. gr.	Extractive	Extractive removed from drug
(*a*) Percolate (16 fl. oz.) ...	1·307	6·8 per cent.	= 10·8 per cent.
Percolate (2nd. 16 fl. oz.)		·9 per cent.	= 1·44 per cent.
			12·24 per cent.
Finished liquor from (*a*)	·990	5·2	= 10·4 per cent.

Finished liquor contained alcohol 20·4 per cent. by volume.

The official liquor containing 7·4 per cent. of extractive out of a possible 13·2, a liquor by percolation from the same sample of drug removes 10·4 per cent., or nearly half as much again. This increase in strength is fully borne out by the respective degrees of bitterness of the two liquors on dilution.

LIQUOR SENEGÆ CONC.

With the exception of calumba, compound sarsaparilla, and senega, the B.P. liquores concentrati are prepared by what may be termed a time-percolation method which, however, has been somewhat facetiously charged with necessitating a day and night service for the proper carrying out of its details. Curious and novel as the directions "to add the remaining menstruum in ten equal portions at intervals of twelve hours" appear to be, the principle is a thoroughly good one, and there is more in the process than at first glance meets the eye. It is, in fact, a kind of re-percolation which ensures the almost complete exhaustion of the drug. It gives particularly good results with senega; even on the small scale the percolate contains over 95 per cent. of the total soluble matter capable of being extracted by the menstruum. Deposition in liquor senegæ conc. may be partly due to variation in the alcoholic strength of the menstruum, but is more particularly attributable to the natural acidity of the drug itself. A strong tincture of senega in 28·45 per cent. alcohol possesses a very pronounced acid reaction, and the drug itself usually contains moisture. In the recently powdered root, this amounted to 7·5 per cent. A sample of liquor senegæ conc. was prepared by the B.P. method, sufficient alcohol being added to the menstruum used for moistening the senega to compensate for the moisture in the powdered root, and the percolation conducted in an air-tight apparatus, so arranged that the required quantity of menstruum could be run in by a tap at the proper intervals. The percolate, which came off clear and brilliant, very gradually but continuously threw down a whitish gelatinous deposit (probably sapogenin) the supernatant liquid still remaining bright. From the appearance of the liquor it seemed likely that this precipitate resulted solely from the decomposition of the senegin brought about by the natural acidity of the liquid. The bright portion was, therefore, decanted, one-fourth of its volume set aside, and the remainder just made alkaline by the cautious addition of solution of ammonia. The part set aside was then added, the final reaction being faintly but distinctly acid. Liq. senegæ conc. B.P. containing the full percentage of alcohol, and with its acidity partially neutralised, keeps well, and may be regarded as a satisfactory preparation.

The gist of the following paper was also given by Mr. NAYLOR:—

Liquor Gentianæ Compositus Concentratus.

By E. H. FARR, F.C.S., and R. WRIGHT, F.C.S.,
Pharmaceutical Chemists.

This is by far the most frequently used of all the so-called concentrated infusions, but for some reason it has not been included in the British Pharmacopœia. Is it possible to prepare a concentrated preparation which will, on dilution, fairly represent the freshly prepared official infusion? The authors have endeavoured to reply to this question. First they ascertained the solvent action of boiling water on dried bitter-orange peel, infusing 55 gr. of the peel cut small in ½ pint of boiling water for fifteen minutes, straining, and cooling; the infusion gave, after drying at 100° C., 0·28 per cent. of residue. Gentian-root: Fifty-five grains, thinly sliced, similarly treated, gave 0·22 per cent. of residue, and it was remarked that the small roots gave the bitterest infusions, though lowest in extractive value. Fresh lemon-peel (¼ oz.), cut small and treated in the same way, yielded 0·072 per cent. of residue. These are means of three experiments in each case. Neither of the lemon infusions (fifteen minutes' maceration) possessed more than a trace of the aroma and fragrance of the lemon, and very little of the aromatic bitter taste characteristic of the fresh peel. By practical experiment it was found that a simple infusion of lemon, using the proportion of peel to menstruum contained in the official compound infusion of gentian, was not equal either in aroma or flavour to the product of admixture of 1 fl. dr. of the official tincture with 1 pint of distilled water. Lemon-peel: 110 gr. lost in drying 78 gr. = 71 per cent. of its weight. The residue, when infused for fifteen minutes in ½ pint of boiling water, yielded, on drying at 100° C., 0·16 per cent. of residue.

From these data it would appear that the residue from official compound infusion of gentian dried at 100° C. should be not less than 0·6 to 0·7 per cent. Two samples were prepared, and they gave a mean of 0·776 per cent. A third infusion was prepared from gentian-root and orange-peel only, and tincture of lemon in the proportion of 2 fl. dr. to the pint added to the finished product. This was superior to the official preparation both in aroma and fragrance. Of this, 25 c.c. gave 0·136 gramme residue dried at 100° C. = 0·544 gramme from 100 c.c.

For the experimental processes for *liquor gentianæ compositus concentratus* (1 to 9) quantities of gentian-root and bitter-orange peel was carefully dried at a low temperature, reduced to coarse powder, and sifted through sieves of the requisite degree of coarseness:—

Experiment I.

Dried bitter-orange peel (in No. 10 powder)	4 oz.
Dried gentian-root (in No. 10 powder)	4 oz.
Dried lemon-peel (in No. 10 powder)	2 oz.
A mixture of 1 volume 90-per-cent. alcohol with 3 volumes distilled water	a sufficient quantity

Mix the powders, moisten uniformly with 12 fl. oz. diluted alcohol; set aside in a closely covered vessel for twelve hours. Pack in a series of four percolators, and extract by re-percolation, using more of the diluted alcohol; set aside for forty-eight hours; filter.

Notes.—(1) Lemon-peel loses almost 75 per cent. of its weight in drying; 2 oz. of the dried equals practically 8 oz. fresh peel. (2) The process yields a good product, but is slow and tedious in operation.

Experiment II.

Dried bitter orange-peel (in No. 10 powder)	4 oz.
Dried gentian-root (in No. 10 powder)	4 oz.
Gratings of fresh lemon-peel ...	8 oz.
Alcohol (90 per-cent.)	4 fl. oz.
A mixture of 1 volume 90 per-cent. alcohol and 3 volumes distilled water	a sufficient quantity

Mix the powders, moisten uniformly with 12 fl. oz. diluted alcohol; set aside in a covered vessel for twelve hours. Mix the lemon-peel with 4 fl. oz. 90-per-cent. alcohol; set aside in a covered vessel for twelve hours. Mix all well together, pack in a series of four percolators, and extract by re-percolation with diluted alcohol. When 35 fl. oz. menstruum has been used and percolation is complete, mix the marcs and express. Mix the liquids, adjust to 32 fl. oz. with diluted alcohol; set aside for forty-eight hours; filter.

Note.—The process is drawn on the assumption that the lemon-peel is used both as an aromatic bitter as well as a flavouring-agent. It is slow, but gives a very satisfactory product.

Infusum Gentianæ Compositum Concentratum (1 to 7).

Experiment III.

Gentian-root (in No. 20 powder) ...	2 oz.
Dried bitter-orange peel (in No. 20 powder)	2 oz.
Dried lemon-peel (in No. 20 powder)	1 oz.
Tincture of fresh lemon-peel * ...	1 fl. oz.
Alcohol (90-per-cent.)	4 fl. oz.
Distilled water	a sufficient quantity

Mix the powders, pour over them 1 pint of distilled water; set aside for twenty-four hours; express. Reserve 10 fl. oz., to which add the tincture and the alcohol. Treat the marc with two further macerations of 1 pint of distilled water of six hours each, press off, mix the liquors, adding any left from the first maceration. Evaporate to 5 fl. oz., and add it to the first portion to make 1 pint.

Notes.—(1) The product of the first expression, using a small hand-press, measured 14¾ oz. (2) The evaporation over a water-bath occupied six hours.

The foregoing process was one of several proposed for insertion in the Conference "Formulary," and with a view of shortening and simplifying it the following modifications were attempted:—

Experiment IV.

This was made precisely as in Experiment III., but—

(1) Boiling water was substituted for cold, and the time of infusion shortened to two hours in each case.

(2) Four ounces of the official tincture of lemon and 2 fl. oz. 90-per-cent. alcohol was substituted for the special tincture and alcohol.

Note.—The products of infusion with boiling water are too viscid, and on the addition of alcohol a considerable deposit of pectinous matter occurs.

Experiment V.

This was carried out like Experiment IV., except that—

(1) The times of infusion were six, three, and three hours.
(2) The dried lemon-peel was omitted.
(3) Two fluid ounces tr. limonis, B.P.C., and 3½ fl. oz. 90-per-cent. alcohol were added to the concentrated infusion.

Note.—The observation made under IV. also applies in this case. The aroma, &c., of these preparations is satisfactory, but they deposit after the first filtration, and are, moreover, deficient in bitterness.

Experiment VI.

This was carried out as Experiment V., the time of the first infusion being extended to twelve hours. The product did not deposit so much as those of the two prior experiments, but was still deficient in bitterness.

Liq. Gentianæ Co. Conc. (1 to 9).

Experiment VII.

Dried bitter orange-peel (in No. 10 powder)	4 oz.
Dried gentian-root (in No. 10 powder)	4 oz.
Gratings of fresh lemon-peel ...	8 oz.
Alcohol (90-per-cent.)	2 fl. oz.
A mixture of one volume 90-per-cent. alcohol with three volumes distilled water	a sufficient quantity

Moisten the mixed powders with ½ pint of the diluted alcohol, place in a closely covered vessel; set aside for twelve hours. Similarly mix the lemon-peel gratings with 2 fl. oz. 90-per-cent. alcohol, and set aside (to convert water in the peel into menstruum). Mix, pack the whole tightly in a percolator, and percolate with 1 pint of diluted alcohol. Express the marc, mix the liquids, adjust to 32 fl. oz. with diluted alcohol; set aside for forty-eight hours; filter.

Note.—Percolate = 17 fl. oz., pressings = 13½ fl. oz.

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* This is made by taking the grated outside peel of fresh lemons 2 oz., alcohol 90-per-cent. 4 fl. oz. Macerate and filter.

Liq. Gentianæ Co. Conc. (1 to 7).

Experiment VIII.

Dried gentian-root (in No. 10 powder)	4 oz.
Dried bitter orange peel (in No. 10 powder)	4 oz.
Tincture of lemon (B.P.)	4 fl. oz.
Alcohol (90-per-cent.)	7 fl. oz
Distilled water	a sufficient quantity

Moisten the powders with ½ pint of distilled water, set aside in a covered vessel for twelve hours, pack lightly in a percolator, and, adding more water, continue percolation until 29 fl. oz. percolate has been collected. Add the tincture and alcohol, with a sufficient quantity of distilled water to produce 1 quart; set aside for forty-eight hours; filter.

Note.—This process works excellently, and the product is very satisfactory.

Experiment IX.

This was conducted precisely as Experiment VIII., but the gentian-root and peel were in No. 20 powder.

Liq. Gentianæ Co. Conc. (1 to 9).

Experiment X.

This was conducted exactly as the last, percolation being stopped when 23 fl. oz. percolate had been collected. To this was added 4 fl. oz. tincture of lemon, B.P., and 5 fl. oz. 90-per-cent. alcohol.

Sp. Gr. and Yield of Extraction of the Concentrated Liquors.

No.	Specific Gravity	Extract dried at 100° C. in Grammes from 100 c.c.	Degree of Concentration
1	1·014	8·78	1 to 9
2	1·014	8·78	1 to 9
3	1·005	7·90	1 to 7
4	1·013	9·65	1 to 7
5	1·014	8·30	1 to 7
6	1·005	7·80	1 to 7
7	1·020	10·50	1 to 9
8	1·004	7·70	1 to 7
9	1·003	7·65	1 to 7
10	1·012	9·00	1 to 9

The standards for extractive, based upon the yield from a freshly prepared infusion, are 6·2 grammes per 100 c.c. for a 1-to-7 preparation, and 7·8 grammes for a 1-to-9 preparation. These afford a fair indication of the value of such preparations. They are only approximate, as the therapeutic value depends upon the proportion of bitter and aromatic principles present, which cannot with accuracy be determined. It will be seen that the extractive-value is in every case above the standard arrived at by calculation from the figures for the official infusion. In the further examination of the samples, comparing them first *inter se* and then their diluted products with the official preparation, the authors were assisted by several pharmacists, to whom samples were sent for comparison. Of these, two selected No. 3, two others No. 9, while a fifth declared that he could not decide between the two. The authors thought there was little to choose between the products of Nos. 3, 8, and 9, No. 3 being rather more bitter, though Nos. 8 and 9 had decidedly the better flavour. All the liquors except those in which boiling water was used for the macerations kept well; no precipitation has taken place, and the flavour and aroma appear to be quite unimpaired.

Discussion.

Dr. **Attfield** said there was a strong desire on the part of medical men to have these preparations in the Pharmacopœia, and they had examined concentrations of the twenty-five official infusions and decoctions, but only ten were admitted because the others were not generally satisfactory. The very important action of chloroform-water did not seem to affect the product at all. From Messrs. Farr and Wright's paper he noticed that they gave 1-to-7 preparations, and he asked why 1 in 10 was not adopted, as that was the tendency now.

Mr. N. H. **Martin**, in reply, said that after the first rush 1-in-9 preparations had fallen as flat as possible in England—there was no sale for them at all. He believed they had been taken up in Ireland. The decimal system might be perfect theoretically, but it was not in use here, and until it was they had to supply what was wanted.

Dr. **Symes** thought one impediment to the more extensive use of concentrated liquors was the fact that they have been made to correspond to 1 in 10 rather than 1 in 8. Medical practitioners who dispense their own medicines use 8-oz. bottles, and want the 1-to-7 infusions. (Hear, hear.)

Mr. **Brodie** said he had always made these liquors by percolation with cold water, and got a better result than by maceration and pressure.

Dr. **McWalter** said that chloroform-water should be adopted with hesitation. He had found that organic solutions made with that solvent soon had an odour like chlorine.

Mr. **Bird**, in reply, said the presence of chloroform-water could not affect the preparations, because the infusion was heated to 212° F., which would cause it all to pass off. These concentrated liquors had certainly obtained a firm footing in Ireland, and to make them 1 to 7, all they had to do was to dilute four parts to five with the official menstruum. Dr. McWalter was quite right as to the cause of deposit in some preparations being the acidity produced in keeping.

The **President** proposed a vote of thanks to the authors, and to Mr. Bird for the excellent way in which he had summarised the discussion.

The next paper was on

Poor-law Drugs Supply.

By Chas. R. C. Tichborne, F.I.C., D.P.H.R.C.S.

This was a record of two years' experience as an analyst for various Boards of Guardians in Ireland. During that time 834 samples of drugs were examined. The author explained the regulations as to taking these samples, under which at least twelve samples per annum from each dispensary must be selected. Of the 834 samples submitted to him, 120 were reported against, and of these 17, or 2 per cent., were perishable articles, such as spt. æther. nit., lin. camph. co., emp. menthol., and spt. ammon. aromat. He meant by a perishable article one that will not keep at a standard strength, although ordinary care may be taken to store it in a suitable vessel and place. The errors of careless making—*i.e.*, a slight difference in such preparations as dilute hydrochloric acid—constitute another 1 per cent., so that, deducting 3 per cent. for perishable articles and careless manufacture, it brings down the sophisticated articles to 11 per cent.

The following are instances of special or uncommon adulterations:—

Boric Acid is generally a fairly pure chemical, and of ten samples examined only one was adulterated, and it contained gypsum in considerable quantities.

Bismuth Salicylate.—In no case could the author find a sample of this salt which would stand the B.P. test for free salicylic acid, and he never certifies against a sample of bismuth salicylate because it will not obey this test.

Emp. Menthol.—He has found it necessary to report against the few samples which he has received of this plaster. It was sent out exactly as ordinary spread diachylon plaster, and looked like it. He finds the calico is generally faced with French chalk and barium sulphate. "Menthol plaster," with some menthol in it, can be easily made. It is only necessary to spread at as low a temperature as possible, and to place the rolled plaster into tin cases which are fairly tight, and it keeps extremely well. A few crystals of menthol inserted into the case will make the process of preserving it about perfect, because the air in the case when saturated with menthol will not take up that contained in the plaster.

Ext. Cascara Sagrada Liq.—Out of 29 samples examined nine were not only inferior, but evidently adulterated. This large percentage of inferior specimens is owing in a great measure to the fact that it is an article extensively in demand by the public outside its use in the legitimate practice of medicine. The extract, if made according to the B.P., should yield about 24 or 25 grammes to the 100 c.c. of fluid extract. There is one simple characteristic of this extract that may be taken as a test—it is that it is not hygroscopic. A few drops left on a glass slide to dry at ordinary temperatures will become in a few hours a bright varnish-like layer without the slightest "tackiness." In some of these extracts glycerin was used, either wholly or partially, in place of spirit. There are other cases which do dry, but still give a more or less decidedly "tacky" feel when dry. On further examination these will generally reduce Fehling's solution.

The author procured a number of samples of the bark from reliable sources, and determined the amount of extractive which they yielded to cold-water infusions. The following are typical results:—

Sample A yielded 33·6 per cent. of extractive.
Sample B yielded 29·9 per cent. of extractive.
Sample C yielded 32·4 per cent. of extractive.
Sample D yielded 34·2 per cent. of extractive.

It is quite evident that as 1,000 grammes of the bark is taken to prepare 1,000 c.c. of B.P. ext. cascara sagrada liq., the standard of 24 or 25 grammes of extractive to the 100 c.c. is not severe. With regard to the reducing-action of the extractive upon Fehling's solution, he found it to be equivalent to from 35 per cent. to 40 per cent. of glucose in all the dry extracts made by himself, but in a sample sent to him for analysis (and condemned) he found it to have a reducing-action equal to 52 per cent. of glucose in the dry extract.

Liniments of Aconite, Belladonna, &c.—At first the use of methylated spirit was not sanctioned by the Local Government Board, but at the beginning of this year it was. Mr. Tichborne commented upon Riche and Bardy's test for methyl-alcohol, and upon the dispensing of methylated liniments in prescription-compounding.

Sulphur Sublimatum.—The B.P. article is rarely supplied. The last sample the author examined contained nearly 1 per cent. of free sulphuric acid.

Pearl-coated Pills.—In regard to these "bullet-like bodies" Mr. Tichborne gave some demonstrations to the meeting to show how slowly they dissolve. He also said that substitution takes place—*e.g.*, menthol for oil of peppermint in pil. rhei co.

Pulv. Jalapæ Comp.—Powdered jalap was in one case supplied.

Tr. Rhei Co.—The glycerin is sometimes left out of this tincture.

It is only fair in a paper of this character that a few words should be said on the side of the contractor. The statistics show that the amount of actual adulteration is very low, and occasionally he is injured by an erroneous opinion given by the analyst. The author does not think this often happens; but his experience is that whatever the analyst says it is sure to be contradicted by the contractor. There have been mistakes made to his own knowledge against the contractor. Pepsins and liquor-pepsins have been condemned (when tested by the Pharmacopœia test) which were quite right. This is owing to the difficulty of keeping a water-bath at a constant temperature for six hours, particularly in a busy laboratory. If the bath once reaches 120° F., even for a short time, the digestive action of the pepsin is at once destroyed. He always uses an incubator similar to the one he uses for bacteriological work, and times it to give a temperature of 100° F. A low temperature, such as 60° or 70°, will do the work of digestion if it lies long enough, but a high temperature destroys it. He has seen perfectly pure butyl-chloral hydrate condemned, owing to the meagre description of the test as given in the Pharmacopœia. It says that "it does not yield chloroform when heated with potassium hydroxide or milk of lime" (absence of chloral hydrates). It is true that it does not yield chloroform, but it throws down a substance exactly like it in appearance—allylene dichloride—and the inexperienced analyst jumps at the conclusion that he has got chloroform. The reaction should be further described by directing this chloroform-like substance to be heated with acetanilidum, when the peculiar smell of phenyl-isonitrile is produced if it contains the impurity. He is strongly of opinion that in connection with the Local Government arrangement the contractor should have an appeal to Somerset House, he being heavily fined if he has given unnecessary trouble.

DISCUSSION.

The PRESIDENT said that as pharmacists they always welcomed any criticism directed against their own business, or against any lapses they might be guilty of, but he ventured to join issue with Professor Tichborne, and to say that the analyses which he had given were not exactly those which came under the head of "pharmacists' errors." (Hear, hear.) These analyses were of drugs which were contracted for, probably at the very lowest prices, by Poor-law Unions, so that they did not represent standard drugs which would come out of the pharmacists' hands. (Hear, hear.) He (the President), in addition to being a pharmacist, was chairman of a large sanitary authority, so that in that dual capacity he might consider himself a sort of buffer between two different sets of feelings; and he could say that, in the position of chairman of the sanitary authority, he had been struck with the excellent quality of the drugs supplied. Some who criticised them were not pharmacists, but trespassers or pirates, and he would say to these that all who understood the business must be well aware that within the last twenty years the standard of the drugs supplied in Great Britain had been wonderfully improved, and that mainly through the efforts of the Pharmaceutical Conference. (Applause.)

Mr. BRUNKER spoke of the improved quality of drugs supplied by contractors in Ireland. He had experience (in his capacity as an adviser to the Irish Local Government Board) of about 2,400 analyses within the last six months, and of that number the samples objected to did not exceed $3\frac{1}{2}$ per cent.; and as that percentage included an old friend, sweet spirit of nitre, and a few other things, this fact added to the character of the contractors. (Hear, hear.) He might also say that of late the pepsin samples had not been sent in in the way that Professor Tichborne referred to.

Mr. PAYNE (Belfast) said that while he was not a Poor-law Guardian himself, he was very closely connected with a Poor-law Guardian—(hear, hear)—and he could say that with regard to the supply of drugs in Ireland, matters had very much improved within the last thirty years. Prior to that time he believed it was the custom to send any rubbish to Ireland in the way of drugs—(laughter)—but since the Irish pharmacists commenced to assert themselves, matters had improved very much. (Hear, hear.) He had made inquiries about the supplies of drugs to one of the largest unions in Ireland—the largest outside the South or North Dublin Unions—and the analyst had very rarely found a defective sample. (Hear, hear.)

Mr. TYRER spoke on the subject of the Riche and Barde test, and said that it was one of the most unsatisfactory tests, unless the most rigid and careful conditions were complied with. He knew of a case in which out of a number of samples that of undoubted pure spirit came out the worst under it. Dr. Levy had obtained good results with rosindulin, and he hoped the results might be brought before the next Conference.

Mr. BIRD remarked that Professor Tichborne had said that liquid extract of cascara should not fall below 22 per cent.; and he would like to know that if a sample containing 25 per cent. came from a contractor, would that be rejected? He thought if collective accounts of those who had made the tests were brought up at the next meeting, it would be a most important matter. (Hear, hear.)

Professor PRESCOTT, U.S.A., said that in the July number of the *Pharmaceutical Review* of the United States would be found some observations and recommendations on the subject of methyl-alcohol and ethyl-alcohol processes, made by an Investigation Committee of the United States Pharmaceutical Association, and on the same subject the results of some experiments were given within the last year in the *American Chemical Journal*. This depends upon reduction by copper oxide and detecting the formaldehyde resulting in the usual way, acetaldehyde being destroyed with hydrogen peroxide, 3 per cent. of wood spirit can thus be detected.

Dr. SYMES and Mr. MARTIN also joined in the discussion, the latter protesting against the use of methylated liniments.

Sir THOS. ROBINSON said that the subject raised by Professor Tichborne was one of great interest to Irish chemists. He regretted that in the past the supply of drugs to Poor-law Unions had been very unsatisfactory, and if within the last six months a very great improvement had taken place, that was more to their discredit than anything else. The system of contracting for unions in the past was that a list of 600 items was selected, and out of these a number were contracted for at varying prices—5*s.* for 5*d.* worth, and 20*s.* for 1*s.* 6*d.* worth—and an average was struck on the total of the items, and the lowest tender at this rate got the contract. The result was that the drugs supplied were of a disgraceful kind. It was only within the last two years that the Local Government Board took the matter in hand and decided that such a state of things was a disgrace to the trade. The Local Government Board got lists from a number of wholesale houses, and from these made out what they considered a fair wholesale price for the drugs, and firms were then asked to contract at so much discount off these prices. What was the result? That within six months there were contracts sent in at 50 per cent. below these prices. In the past some of the tinctures were of such a nature that he (Sir Thomas) wondered how they ever reached their destination, they were so short of spirit. (Laughter.) It was now compulsory on medical officers of Poor-law Boards to take samples of the drugs and have them analysed, and he was glad to say that the manufacturers and traders were now supplying unions with drugs at only 2, 3, or 5 per cent. below the Local Government Board standard price. (Hear, hear.)

The Conference then adjourned for luncheon.

Fourth Session.

Professor Tichborne, in reply, said that he did not think any very crucial statement had been raised. So far as the drugs generally were concerned, he did not think he was very hard on the supplies, and that he gave them every merit; but he did not agree with Professor Brunker that 3 per cent. would represent the percentage of inferior and adulterated drugs. He (Professor Tichborne) was surprised to find it was only about a matter of 11 per cent. when he made up the statistics. He did not deal in speculation, he dealt with facts, as he did not care to speculate on things that might injure men or trade. (Hear, hear.) Since the Public Boards had control of analyses, common sense would show that the supplies of drugs would now be better than when there was not such control; and he would like to see the hospitals follow suit. (Hear, hear.) Their first consideration should be to get good physicians and surgeons, and, next, to supply good drugs. (Hear, hear.) With regard to the tests for methylic alcohol he could sympathise with their manufacturing friends when they spoke disrespectfully of the tests; but they had no better. The Excise had paid every attention to the subject, and no better test had yet been invented. It was true there were many samples of pure spirit that would give a reaction, but there was a great difference between the dull rose colour given in the one case and the intense purple colour got by the use of methylated spirit He thought there was some little confusion about methylated spirit being used without authority.

A vote of thanks having been accorded to Professor Tichborne for his paper,

The President said that the more they as pharmacists came in contact with professional analysts in this way the better, and they would be thus able to get rid of some vexed questions. It was admitted that the purity of drugs had reached a very high standard in Great Britain, and that was principally owing to the efforts of that Conference. (Applause). He wished to say from that chair that as pharmacists they knew nothing of the use of methylated spirit in medicine. (Applause.)

Previous to Professor Tichborne's reply Mr. Naylor read the following in abstract:—

Causes of the Loss in Strength of Sweet Spirit of Nitre.

By E. H. Farr, F.C.S., and R. Wright, F.C.S.,
Pharmaceutical Chemists.

The object of the experiments detailed in this note was to ascertain the correctness, or otherwise, of two ideas. First, Is the spiritus ætheris nitrosi, Ph. Lond., more stable than the stronger preparation of the British Pharmacopœia? and, second, that the remarkable loss in strength exhibited by certain samples of sweet spirit of nitre which had come under the authors' notice could not be satisfactorily accounted for by any theory of chemical change. The observation that this sudden drop in the percentage of ethyl nitrite was always most noticeable when the spirit was introduced into a bottle capable of holding a much larger quantity, so that a considerable air-space was left above the level of the liquid, pointed strongly to the fact that the deterioration in strength is due, not to chemical decomposition, but to the rapid elimination of ethyl nitrite from the spirit, and its diffusion into the air in contact with the surface of the liquid. Two samples of the spirit were prepared on January 16, 1901, by the processes of the London and British Pharmacopœias. The processes were slightly modified in order to obtain the greatest possible yield of ethyl nitrite. The products were diluted with 90-per-cent. alcohol, and gave preparations 5 c.c. of which yielded 21 c.c. and 35 c.c. of gas respectively by the official nitrometer method. In order to test the effect of keeping under varying conditions a sample of each was (about the above-mentioned date) disposed of in the manners under-noted:—

(1) A well-stoppered 1-oz. white-glass bottle was filled and placed in a cool, dark cellar.

Estimated on January 17 by the official process, 5 c.c. of spt. æth. nit., P.L., yielded 21 c.c. gas, and on May 6, 19·8 c c. The same quantity of the B.P. spirit yielded 35 c c. gas on January 17, and 32·4 c.c on May 6.

(2) Two fluid ounces was introduced into a well-stoppered green flint-glass bottle of 4-oz. capacity, and placed in a window facing east.

In this case the results were:—

P.L. spirit...	Jan. 17, 21 c.c.	Feb. 20, 13·6 c c.	May 1, 0·7 c.c.
B.P. spirit...	„ 35 c.c.	„ 25·2 c.c.	„ 1 c.c.

(3) Eight fluid ounces was introduced into a well-stoppered green flint-glass bottle of 20 fl. oz. capacity, and placed on a shelf about 5 feet above an open fireplace in which a fire was burning daily. The stopper was taken out every morning, and the bottle tilted as in the act of pouring.

Periodical tests showed a sudden drop, then a gradual diminution of nitrous constituents. Thus the P.L. spirit fell to 15 c.c. gas on March 18, and to 13·2 c.c. on July 1; the B.P. spirit to 25·2 c.c. on March 18, and 20 c.c. on July 1.

(4) Eight fluid ounces was introduced into a well-stoppered green flint-glass bottle of 40 fl. oz. capacity and placed on the top shelf of the pharmacy, near a window facing north. The stopper was removed daily, and the bottle tilted as in the act of pouring.

This afforded a corroboration of the experiments in (3), the losses being about 1 c.c. more, due entirely to the greater loss in the first fortnight.

(5) Two fluid ounces of spiritus ætheris nitrosi, B.P., was put into a stoppered green-flint Corbyn quart (capacity, 50 fl. oz.) and allowed to remain at rest in the pharmacy, a little being abstracted from time to time for measurement of the gas.

The sample was tested on February 16, and 5 c.c. gave 33·6 c.c. gas; on February 18, 23·8 c.c.; February 20, 20·4 c.c.; February 23, 18·8 c c.; March 4, 16 c.c.; March 13, 12·7 c.c.; March 27, 8 c.c.; and April 30, 0·8 c.c.

(6) Two fluid ounces of spiritus ætheris nitrosi, B.P., was introduced into a stoppered Winchester (capacity, 100 fl. oz.) and allowed to remain at rest in the pharmacy, a little being abstracted from time to time for measurement of the gas.

Here, again, the losses corroborated (5). The decrease on February 18 was to 20·6 c.c. of gas, on March 27 to 5 c.c., and on April 30 to *nil.*

Harvey (*C. & D.*, May 25, 1901, page 834) has shown that when a small quantity of solution of ethyl nitrite is put into a bottle and well shaken it loses in some cases 80 per cent. of its strength with startling rapidity. The authors have found that this loss in the case of the official spirit does not go on indefinitely. The very slight progressive diminution in strength shown by some of the samples kept under observation led them to the conclusion that, except when exposed to direct sunlight, very slight loss takes place after the superincumbent air has become saturated with the vapour, until fresh air is admitted into the bottle. Thus, some stock spirit was tested on December 3, 1900, and standardised to yield seven times its volume of gas. On May 17 this was tested, the bottle being one-third full. 5 c.c. yielded 17·6 c.c. gas. After being well shaken for five minutes 5 c.c. yielded 17·3 c.c. gas. Another sample tested in the same way gave 13 c c. gas before agitation, and 12·6 c.c. afterwards.

Harvey stated that the destructive action of direct sunlight upon the spirit may be prevented by keeping it in amber-coloured glass bottles, as directed in the United States Pharmacopœia. The authors put this statement to the test, and found that diffused light, however bright, has no chemical action on the spirit, but that exposure to direct sunlight is fatal. The observation by Harvey that amber-coloured glass affords perfect protection to the spirit in all circumstances was confirmed.

The President, Dr. Attfield, and Mr. J. R. Hill discussed the paper briefly, the last saying that defective stoppering causes loss, which is why glycerin acts as a "preservative."

Arsenic in Ferrum Redactum and its Approximate Determination.

By E. S. PECK, M.A.

In his 1898 Conference-paper the author drew attention to the presence of arsenic in ferrum redactum, and Dr. Attfield suggested in his "Digest of Researches" that the official arsenium limit laid down under glycerinum might be tentatively adopted. The presence of sulphides, and the difficulty in a simple apparatus of being sure of absorbing the whole of the sulphuretted hydrogen involved, made that method unsatisfactory. In the new German Pharmacopœia the limit of arsenium is fixed by its detection with a solution of stannous chloride as follows:—

> A mixture of 0·2 gramme of reduced iron and 0·2 gramme of potassium chlorate is put into a large test-tube and 2 c.c. of hydrochloric acid poured over it. After the reaction is ended, it is warmed until the free chlorine is driven off and the solution is filtered. 1 c.c. of the filtrate with 3 c.c. of solutio stanni chlorati should not take a darker colour in the course of an hour.

The solution of stannous chloride is made as follows:—

Crystallised tin chloride	5 pts.
Hydrochloric acid	1 pt.

> Stir to make a paste, and then completely saturate with dry hydrochloric-acid gas. The solution is then filtered through asbestos, and is described as a pale-yellowish strong-smelling liquid with a sp.gr. of at least 1·900.

It occurred to the author in testing, that a definite coloration was due to a definite amount of arsenium, and that the darker the coloration the greater the quantity present. A series of experiments proved this. Definite quantities of ferrum redactum containing known quantities of arsenium yielded a clear gradation according to the proportion of arsenious oxide present, and it was possible to approximately copy the coloration given by the sample of ferrum redactum containing unknown quantities of arsenium. A 1-per-cent. solution of arsenious oxide in dilute hydrochloric acid was then taken, and various quantities evaporated on a water-bath to low bulk and treated with 3 c.c. of the stannous-chloride solution—at this strength the brown coloration was immediately produced, but quickly resolved itself into a heavy brown precipitate with a clear supernatant liquid, showing that the test will not work satisfactorily quantitatively with a solution of arsenious acid so strong as 1 per cent. This brown precipitate, Crookes states, consists of from 95·46 to 98·85 per cent. of metallic arsenium and that tin chloride does not act upon combinations of antimony under the same conditions. 0·1 c.c. of a 0·01 solution of arsenious oxide was then warmed with 3 c.c. of the stannous-chloride solution and a definite coloration took place, showing the great delicacy of the test. Other strengths being taken, the gradation was found to be even, to form in from five to fifteen minutes, and to remain for at least two or three hours. Sodium arsenate gave colour-results corresponding to its arsenic content. Applying the test to ferrum redactum, it was found that, if the coloration obtained by treating the sample according to the directions given before was sufficient to entirely overcome the very slight greenish tint of the hydrated ferrous chloride, it was necessary only to take certain volumes of a 0·01 per cent. As_2O_3, evaporate to low bulk, add 3 c.c. of stannous-chloride solution, and decide which quantity gave a corresponding coloration, and from these data calculate the approximate percentage of arsenium present.

Sixteen samples were collected and tested with the modification of making the solution up to 2 c.c. after driving off the chlorine and before filtering. The filtrate, 1 c.c representing 0·1 gramme of the ferrum redactum, was placed in a small evaporating dish, 3 c.c. of the stannous chloride added, and the coloration compared with those of the standard. Experiments were made to see that the coloration was really due to arsenic. The author suggests the following as the limit of arsenical contamination for the B.P. authorities to consider:—

(1) That 0·2 gramme be taken and treated as described.

(2) That the solution, after driving off the chlorine, be made up to 2 c.c. with HCl, then filtered, of which 1 c.c., corresponding to 0·1 of the sample taken, should be treated with 3 c.c. of the $SnCl_2$ (sp. gr., 1·900) solution.

(3) That no light-brown coloration should take place within one hour, corresponding approximately to 0·1 per cent. of arsenium.

Of the sixteen samples examined, six showed measurable quantities of arsenium and three *nil*. The rest gave slight indications. The percentages of arsenium in the six bad samples were calculated to be 0·1898, 0·01516, 0·0227, 0·2653, 0·379, and 0·151.

DISCUSSION.

Mr. BIRD said he had examined a number of samples of ferrum redactum, and he could appreciate the very ingenious nature of the test which Mr. Peck had devised for determining the amount of arsenic in that substance. The limit which Mr. Peck suggested was $\frac{1}{10}$ per cent. He (Mr. Bird) had examined samples of foreign manufacture which contained about that proportion of arsenic, while the English samples contained much less. He suggested, therefore, that $\frac{1}{100}$ per cent. would be sufficient.

Dr. ATTFIELD asked Mr. Peck if he preferred the copper-sulphate or the perchloride method of estimation.

Mr. J. C. UMNEY thought, with reference to the limit of arsenium to $\frac{1}{1000}$, that was a little higher than it was necessary to put it. From the examination of many samples, he thought one-tenth of that would be quite sufficiently high. (Applause.)

Mr. BIRD: Five grains of ferrum redactum would contain with the $\frac{1}{2000}$ limit $\frac{1}{200}$ gr.

Dr. ATTFIELD asked would 0·05 do.

Mr. SAVILLE PECK, in reply, said he was quite willing to fall in with the suggestion of Mr. Bird and Mr. Umney, and would be quite satisfied with 0·05, but that was a matter for the final court of appeal—the General Medical Council.

Dr. ATTFIELD: No, no; they are advised by gentlemen like Mr. Peck.

Mr. PECK then referred in detail to the German samples, and said he saw no reason for altering his decision to use the mercuric-chloride method rather than the copper-sulphate method for estimation. (Loud applause.)

The next papers read were on

A Soluble Manganese Citrate and Some Compounds of Manganese with Iron.

By FREDERICK B. POWER, Ph.D.

(*A communication from the Wellcome Chemical Research Laboratories.*)

It is worthy of note that neither the British nor the German Pharmacopœia, in their latest editions, has adopted any salt of manganese, or preparation made therefrom; the United States Pharmacopœia recognises only manganese dioxide and manganese sulphate, whilst the French Codex, in addition to these, includes also the carbonate. Although considerable diversity of opinion has existed, and apparently still exists, respecting the therapeutic value of manganese compounds, their wide distribution in organic nature, and their occurrence, together with iron, in the human body, in the blood and bile, would appear to render it probable that they play some part, however subordinate, in the vital processes of both animals and plants. There can also be little doubt that the value of manganese compounds as medicinal agents depends to a considerable extent upon the form in which the element is administered. Manganese dioxide, for example, is still occasionally prescribed, notwithstanding its frequent impurity, its complete insolubility in water, and its very sparing solubility in dilute acids. With regard to the various salts of manganese at present known, several of which have been recommended from time to time for medicinal use, those which contain the element in organic combination appear to have been most favoured, and to have become most largely employed. It furthermore seems probable that even among the organic salts those which are most freely soluble in water, and therefore most readily assimilated, will be found more effective than the less soluble ones.

These considerations have led to some experiments resulting in the preparation of such a soluble organic salt of manganese and some compounds with iron, the description of which is given in the present paper.

1. *Soluble Manganese Citrate.*—The author referred to Kämmerer's observations (*Liebig's Annalen*, cxlviii, 1868, page 314), doubting his conclusions as to the composition of some citrates, as he regarded citric acid as tetrabasic. Of the simple citrates of manganese two salts of different composition are found in commerce. Both of them occur in the form of a white powder, sparingly soluble in cold water. One of these, of German manufacture, was found by the writer to contain 17·8 per cent. of manganese, and is evidently an acid salt. A salt of the composition $MnHC_6H_5O_7.4H_2O$ would require 17·3 per cent. Mn. Another salt, of English manufacture, was found to be a normal manganese citrate, containing 23·58 per cent. Mn., and corresponds to one of the salts first prepared by Kämmerer—namely, $Mn_3(C_6H_5O_7)_2.9H_2O$, which requires 23·3 per cent. Mn. These salts were assayed by simple ignition, and weighing the residue as Mn_3O_4.

The last-mentioned salt serves as the basis for the preparation of a soluble manganese citrate. Although obtained by Kämmerer (*loc. cit.*) by heating a solution of manganous acetate with citric acid, the writer has prepared it by the action of citric acid upon manganous carbonate, as follows:—

Manganese sulphate, cryst.	...	100 grammes
Sodium carbonate, cryst. ...	...	140 grammes
Citric acid	...	62·8 grammes

The manganese sulphate and sodium carbonate are dissolved separately in a convenient quantity of water, with the aid of heat, and filtered. To the solution of manganese sulphate the sodium carbonate is added gradually, with constant stirring, and the precipitate, after being allowed to subside, is washed repeatedly by effusion and decantation with water until the washings afford not more than a slight reaction for sulphate. The moist manganese carbonate is then brought into a porcelain dish with a little water, the citric acid added, and the mixture heated on a water-bath for about half an hour, with occasional stirring. If the dry salt is desired, the product, which should form a somewhat thick mixture, is brought on a filter, washed with a little water, and dried at a gentle heat.

It is thus obtained as a white crystalline powder, and the yield of the salt on a small scale is very near the theoretical. When assayed it afforded 23·17 per cent. Mn. as compared with 23·3 per cent. Mn. calculated for $Mn_3(C_6H_5O_7)_2\ 9H_2O$.

The soluble manganese citrate was prepared as follows:—

To the simple manganese citrate, obtained as above from 100 grammes manganese sulphate, while still moist and contained in a porcelain dish, 105 grammes of crystallised sodium citrate are added, and the mixture heated on a water-bath until complete solution is effected. The liquid is then diluted sufficiently to filter readily, and at once spread on glass plates, so that on drying it may be obtained in the form of scales.

The salt in the state of solution oxidises readily and becomes brown, but in the dry state it is quite permanent when protected from the light. The amount of sodium citrate employed corresponds very nearly to the following molecular proportions:—

$$\frac{Mn_3(C_6H_5O_7)_2.9H_2O}{703} + \frac{2Na_3C_6H_5O_7.5\frac{1}{2}H_2O}{714}.$$

The salt forms handsome pearly scales, which are very freely soluble in water. Like other similar scale salts, it cannot be considered a definite chemical compound, and is subject to slight variations in composition according to the care exercised in its preparation, the thickness of the scales, and the temperature at which they are dried. Several determinations of the manganese have shown the latter to vary within the limits of about 12 to 13 per cent.

It is stated by Landrin that from solutions of the salt prepared by him the manganese is not precipitated by ammonia nor by potassa, incompletely precipitated by alkali carbonates, and completely precipitated by ammonium sulphydrate, in the latter respect having a character contrary to that indicated by Spiller for the action of alkali monosulphides on solutions of manganous salts in alkali citrates (*Journ. Chem. Society*, 1858, vol. x. page 110, and *Pharm. Journ.*, 1858, vol. xvii, page 282). In the paper by Spiller he records the following observation:—

The protoxide of manganese is not precipitated by potassa, nor the carbonate by sodium carbonate, in presence of a soluble citrate. On exposure to the air the brown binoxide of manganese separates from the former only of these solutions. Sulphide of manganese is not at all precipitated.

The soluble manganese citrate prepared by the writer is not precipitated by ammonia nor at once by potassa, although gradually forming with the latter a brown precipitate; it is either not precipitated by the alkali carbonates, or gives but a slight turbidity. It is, however, at once and abundantly precipitated by ammonium sulphydrate, as also by potassium ferrocyanide. He made some experiments to ascertain the cause of the above discrepancy, and found that it is explained by the fact that the precipitation of manganese by ammonium sulphydrate in the presence of alkali citrates depends simply upon the greater or less amount of the latter that may be contained in the solution.

II. Soluble Iron and Manganese Citrate.

A few years ago Dr. Da Costa, of Philadelphia, recommended the hypodermic use of iron, especially in those cases where a rapid action is needed, as after severe hæmorrhage, and for those people who have such delicate digestions that they cannot assimilate the iron when given by the mouth (*Lancet*, July 4, 1896, page 227). The preparation employed for this form of administration was stated to be a ferrous-manganese citrate, which is stable and has not the irritating properties of many other compounds. The solution was prepared by dissolving the salt in hot distilled water in the proportion of 1 gr. to 5 minims. A preparation, possibly designed to meet these special requirements, has been issued by a German manufacturer, under the name of "ferro-manganum citricum," and is in the form of reddish-brown scales, freely soluble in water. A specimen of this salt, examined by the writer, contained the iron, however, not in the ferrous, as the name would imply, but in the ferric state. An analysis showed the presence of 15·3 per cent. of iron and 9 7 per cent. of manganese.

The salt now brought to notice differs somewhat from the above in its character and in the percentages of iron and manganese. It is calculated to contain as nearly as possible two parts of metallic iron to one part of manganese, and these proportions may be attained within very close approximations in practice. The method adopted for the preparation of this compound is as follows:—

Simple manganese citrate is first prepared in the manner described under soluble manganese citrate. If, for example, 100 grammes of crystallised manganous sulphate were employed for this purpose, this would correspond to 24·66 grammes of manganese. A solution of ferric citrate is then taken, and the percentage of metallic iron contained therein is determined, for which purpose the iodometric method of assay is both accurate and convenient. If, for example, the iron solution, such as that of the U.S. Pharmacopœia, be found to contain 8 per cent. of metallic iron, 616·5 grammes of it will be required in order to represent 49·3 grammes of iron, an amount corresponding to twice that of the manganese employed.

To the moist manganese citrate, contained in a porcelain dish, is added the solution of ferric citrate, and the mixture heated on a water-bath until complete solution is effected. The liquid is then filtered, evaporated to the consistence of syrup, and spread on plates of glass, so that on drying it may be obtained in the form of scales. It forms handsome yellowish-brown scales, which are readily soluble in water, especially when slightly warmed, affording a clear, yellowish solution. The solution is not precipitated by ammonia, which produces a deep red colour; with potassium ferrocyanide it affords a light-blue precipitate, changing to deep blue on the addition of a mineral acid.

The salt may easily be assayed by igniting a portion for the determination of the total mixed oxides, and then in this residue or in a separate portion of the salt determining the iron volumetrically. The amount of metallic iron found is subsequently calculated as Fe_2O_3, the latter deducted from the total amount of oxide, and the remainder, consisting of Mn_3O_4, calculated for the corresponding percentage of manganese.

III. Soluble Iron and Manganese Phosphate.

This salt is calculated to contain the same relative proportions of iron and manganese as the preceding, and its method of preparation is precisely analogous. Like the so-called soluble phosphate of iron of the U.S. Pharmacopœia, it is really a citro-phosphate. It was prepared in the following manner:—

Manganese sulphate crystals ...	100	grammes
Sodium phosphate crystals ...	240	grammes
Solution of ferric citrate (containing 8 per cent. Fe)	616·5	grammes,
or A corresponding amount of solution of other percentage strength.		

The salts are dissolved separately in a sufficient amount of water, with the aid of heat, and filtered. To the solution of manganese sulphate, while warm, is added the warm solution of sodium phosphate. The precipitate of manganese phosphate is allowed to subside, and washed by affusion and decantation with water until the washings afford not more than a very slight reaction for sulphate. The precipitate, while still moist, is then brought into a porcelain dish, the solution of ferric citrate added, and the mixture heated on a water-bath until complete solution is effected. It is then filtered, and the liquid spread on glass to scale in the usual manner. The salt should be kept protected from the light.

It forms handsome, greenish-yellow scales, which are slowly soluble in cold but readily in warm water, and the solution has the general properties described under iron and manganese citrate. Like the latter, it ordinarily contains about 14 per cent. of iron and 7 per cent. of manganese. The amount of iron contained in the salt may be readily and directly determined by the iodometric method, whilst for the determination of the manganese the usual gravimetric methods for the separation of the two metals must be resorted to, with the consideration of the presence of both citric and phosphoric acids.

In conclusion it may be suggested that in view of the combined character of these compounds—their ready solubility in water, freedom from objectionable taste, and relative uniformity in the amount of their constituent elements—they would appear to merit favourable consideration, and to be well adapted for medicinal use.

The Chemical Character of So-called Iodo-tannin Compounds.

By F. B. Power, Ph.D., and Frank Shedden, B.Sc., A.I.C.

A number of preparations made by the action of iodine upon tannic acid, or upon drugs containing considerable amounts of tannin, such as krameria, cinchona, &c., have been used medicinally for many years, especially in France, where they appear to have originated. They are usually in the form of a syrup or wine, and various working formulæ for them have been published (see, for example, *Rép. de Pharm.*, 1896, pp. 145–150; *Hager's Handbuch*, Bd. I., p. 138, Bd. II., p. 141; also the "Sirup de raifort iodé" of the French Codex). Since they contain no free iodine it is assumed, or stated, that the iodine is in organic combination with the tannin, and that they are, therefore, more readily assimilated than the alkali iodides, whilst not producing the unpleasant effects which sometimes attend the use of the latter.

The purpose of this communication from the Wellcome Chemical Research Laboratories is to show upon what basis such suppositions rest. The authors first reviewed the literature of the subject, showing that Schmidt (*Pharm. Chemie*, 3rd edit., Bd. II., p. 1017) states that "a solution of tannic acid takes up iodine in considerable amounts, forming a reddish-brown liquid, in which free iodine can no longer be detected by starch-paste." Hager repeats this and adds that the liquid contains organically combined iodine. Flückiger (*Pharm. Chemie*, 2nd edit., pt. II., p. 356), also deals with the matter. The first study of the subject was by Socquet and Guilliermond (*Journ. de Pharm. et de Chimie*, 3, xxvi, 1854, pp. 280–285), they observing that the action of iodine upon tannin only takes place in the presence of water, and that tannin thus dissolves as much as half its weight of iodine, a true chemical combination resulting.

As the result of their experiments, these authors concluded:—

> That during the contact of the water, iodine, and tannin, a portion of the water becomes decomposed; that hydriodic acid is formed, and that a portion of the tannin is transformed, by oxidation, into a particular tannin which is less soluble than ordinary tannin, and that the *unaltered tannin forms with hydriodic acid a soluble and stable combination which even distillation is not able to change.*

They recommended extract of rhatany for an iodo-tannin syrup, and in place of gallo-tannic acid, on account of the disagreeable astringency of the latter.

Barnouvin (*Rép. de Pharm.*, 1892, p. 350, and *Proc. Amer. Pharm. Assoc.*, 1893, vol. 41, pp. 578, 775) described a so-called "iodo-tannin compound," which he prepared by adding iodine to tannin in such a proportion that after standing for an hour or two it no longer gave a reaction for free iodine with starch. It was then evaporated to a syrupy consistence, and scaled. In a later paper (*Rép. de Pharm.*, 1898, 3 Ser., 10, p. 337) Barnouvin writes on the action of iodine upon gallic acid, and states that gallic acid possesses the same property as tannin. The latest study of the subject is by Professor Gay (*Rép. de Pharm.*, 1896, pp. 145–150), who refers to Guilliermond's observations, and describes the various methods for the preparation of iodo-tannin syrups, recording a number of experiments as evidence of the so-called absorption or dissimulation of iodine by invert sugar or by glucose. Professor Gay considered that, from a therapeutic point of view, it matters but little whether the iodine is dissimulated by the tannin or by the sugar. The present authors point out that no definite compound of iodine with either tannic or gallic acid has as yet been described, although the well-known bromo- and dibromogallic acids, $C_6HBr(OH)_3COOH$ and $C_6Br_2(OH)_3COOH$, are very easily prepared. They determined, in the first place, the amount of iodine taken up by tannic and gallic acids in aqueous solution under different conditions of time and temperature, and found that in the cold 0·10 gramme of tannin in 10 c.c. of water (1-per-cent. solution), contained in a glass-stoppered bottle, absorbs 0·036 gramme of iodine in one hour, 0·037 gramme in four hours, and 0·051 gramme in twenty-four hours. Heated in a water-bath the same quantity of tannin absorbed in one hour 0·162 gramme of iodine, 0·196 gramme in four hours, and 0·225 gramme in eight hours. Of gallic acid, in 0·5-per-cent. solution, 0·10 gramme absorbed 0·088 gramme iodine in one hour in the cold, 0·092 gramme in four hours, and 0·178 gramme in twenty-four hours; heated in water-bath 0·10 gramme absorbed 0·367 gramme iodine in one hour, 0·414 gramme in four hours, and 0·474 gramme in eight hours.

The amount of iodine necessary to react with 0·10 gramme of tannic acid to form a mono-substitution product would be 0·078 gramme; to form a di-substitution product 0·157 gramme. The amount of iodine necessary to react with 0·10 gramme of gallic acid to form a mono-substitution product would be 0·135 gramme; to form a di-substitution product 0·270 gramme. The amounts of iodine taken up are very variable, however, and are not in any definite molecular proportion to the tannic or gallic acid employed.

The authors next described experiments to determine the action of iodine upon tannic acid. They first heated 5·0 grammes of tannin, 1·275 gramme of iodine, and about 60 c.c. of water until free iodine disappeared. After standing for twenty-four hours the liquid deposited about 0·5 gramme of a dark brown powder, which gave the ellagic acid ($C_{14}H_8O_9$) reaction. The filtered liquid was diluted with water to 250 c.c., and 50 c.c. of this was digested with 2 grammes of hide-powder for several days, then filtered, the powder well washed, and the combined liquids titrated with decinormal NaOH, using methyl orange as an indicator. The result showed 0·997 gramme of iodine as hydriodic acid in 250 c.c. of liquid. This was confirmed by precipitation with silver nitrate, and it was conclusively demonstrated that a large proportion of the iodine (supposed to have combined with the tannin) had been converted into hydriodic acid. More crucial quantitative experiments revealed the fact that the whole of the iodine is thus combined, the whole of the halogen being precipitated by silver nitrate.

Similar experiments as to the action of iodine upon gallic acid proved that all of the iodine contained in a solution of 5 grammes of the acid and 1·2615 gramme of iodine in 50c.c. of water was in the form of hydriodic acid. The results demonstrate that the crystalline product obtained by Barnouvin under similar conditions, and which he assumed to be an iodo-gallic acid, although apparently without having further examined it, consisted simply of gallic acid, with a little adhering hydriodic acid.

In this connection it may be noted that some preparations designed for medicinal use have recently been patented by German manufacturers under the designations of "Tanninhaltiger Jodleimverbindungen" (iodo-gelatin compounds with tannin), "Bromtannineiweiss-Verbindungen" (bromo-tannin albumen compounds), &c. Compare *Chemiker Zeitung*, 1901, No. 9, page 91, and No. 41, page 449. These are stated to be prepared by precipitating respectively a solution containing iodine and tannin with gelatin, or a solution of bromine and tannin with albumen. It is obvious, however, that these preparations are of a very different character from those now dealt with.

The experiments establish the fact that true or definite compounds of iodine with either tannic or gallic acid cannot be formed by the simple interaction of these bodies in the presence of water, for, as might be expected under these circumstances, the iodine acts simply as an oxidising agent. The resulting products, therefore, contain the iodine in the form of hydriodic acid, associated with more or less unaltered tannic or gallic acid, and the oxidation products of the latter. In accordance with these facts, and with the opinion previously expressed by Professor Gay, it follows that unless the physiological action of tannin is desired conjointly with that of the iodine there is no necessity for its use as a means of effecting the chemical change resulting in the so-called dissimulation of the iodine. In place, however, of the various other expedients that have been proposed for attaining this result, it would be more rational, from the standpoint of accuracy in medicine, to employ a preparation containing a definite amount of hydriodic acid, for which a syrup is probably best adapted, the strength and dosage of which can so easily be controlled.

As a further result of this investigation, and in the attempt to obtain a definite compound of iodine with tannic or gallic acid, the authors have been led to undertake a more extended chemical study of these acids and some derivatives of them, and this is still engaging their attention.

Discussion.

Dr. **Attfield** said whatever the therapeutic effect of manganese may be, Dr. Power's paper once more demonstrated that pharmacology on the chemical side was ahead of the therapeutic side of the subject. He was also enlightened as to the iodo-tannic syrups.

Dr. **Symes** said he knew as a matter of fact that a solution of ammonio-citrate of manganese (prepared like liquor bismuthi) had given satisfactory results.

The **President** said the fact is there is manganese in river-water, and plants assimilate it.

Dr. **Power** replied, and presented specimens of the new salts to the Pharmaceutical Society of Ireland, which Mr. **Beggs** acknowledged.

At this stage the meeting had the opportunity of seeing how the

Lantern in the Lecture-theatre

is worked, as Dr. Power showed the slides illustrating Mr. Perrédès's paper on robinia-bark. From the dome of the lecture-theatre an umbrella-shaped blind descended and darkened the theatre. Then the slides were shown, and so pleased the meeting that Dr. **Power**, the **President**, and Dr. **Attfield** were required to propose the requisite votes of thanks.

The following paper was then read by the first-named author:—

Additional Notes on Cardamom-fruits.

By R. C. Cowley and J. P. Catford.

In a paper read before the Liverpool Chemists' Association (*C. & D.*, lviii., 472) the authors pointed out that combustion in a platinum dish of cardamom-seeds leads to inaccurate results owing to reduction of the phosphorus compounds into phosphides, and they suggested the use of ammonium nitrate as an oxidising agent to complete the oxidation. Further experiments on different samples, however, have shown that combustion in a clay pipe, also then suggested, produces results which closely correspond with those obtained with the use of the oxidiser. Neither method is, however, by any means perfect. They have since examined Malabar, Mysore, and Mangalore cardamoms, which Messrs. Evans, Sons & Co. gave them, and some of the results are tabulated in the following:—

Variety	Malabar	Mysore	Mangalore
Number of fruits in 10 gms.	80	55	45
Percentage proportion of pericarp	30	25	20
Percentage proportion of seed	70 { dark 57 light 13 }	75	80
Percentage of ash from dark seed	5	3·3	2·9
Percentage of ash from light seed...	8·5–9	4·5	—
Percentage of ash from pericarp	13	7·1	7·6

Lime was found to predominate in pericarps of all varieties to such an extent than an admixture of 20 per cent. of pericarp with seed is readily distinguished by precipitating the lime as oxalate from the acetic-acid solution of the ash. Two-thirds the ash of Malabar pericarps is soluble in acetic acid, but of the seed-ash less than one-half is soluble, and this portion is mainly composed of potassium salts. Manganese and iron are present in all varieties of pericarp and seed; but in the Mysore cardamoms only comparatively small traces are shown when small quantities are examined, such as would be used for pharmacopœial testing. Cobalt was not found in any of the three varieties—a result which entirely differs from those obtained from previous experiments with the seeds. There was another point of difference—viz, that dark and light Malabar seed on fusion did not differ in yield of metallic oxides as was previously recorded.

The authors proceeded to say that a quantitative test for volatile oil would not be so complicated or tedious as many of the standardising processes commonly in use. Absolute accuracy is not essential—*e.g.*, 10 grammes of seed might be required to yield 0·3 to 0·4 c.c. of volatile oil. They concluded with these observations:—

> An ash-determination of cardamom-seed in itself is of questionable value as an index of quality.
>
> The mineral constituents are not constant even in individual varieties.
>
> The large proportion of lime in the pericarp is characteristic of all varieties.
>
> The ash-percentage of light-coloured seed is always higher than that of the dark, because of the imperfect development of the organic matter.
>
> The high proportion of mineral substances in Malabar cardamoms is not a matter to be ignored, for they think the medicinal action of the drug does not depend entirely on the volatile oil.

Owing to the shortness of the time (it was 3.46), the author of the next paper merely described Michael's powder-divider and Cribb's condenser. The paper was

On Uniformity of Dispensing.

By A. L. Doran.

After a few preliminary remarks, the author, in the course of this paper, referred to the ambiguous prescription by which at one time or another so many of us have had our business arrested and our tempers ruffled. An example is, as usual, the best way to state the case. A prescriber in the Riviera writes, after the astrological sign, pepsin chloride, together with other things in a tincture. From the *primâ-facie* evidence of its stamps the recipe has been dispensed there and in London. What happens? The patient is delayed, all available authorities are consulted, the wholesale houses are strongly moved to procure or explain: net result is as with the bishop's little problem in entomology—nobody knows. The chemist who dispensed it in London is finally consulted, and with the courtesy characteristic of chemists to one another, replies that he does not know, but used scale pepsin. We now do the same, and with apologies to the patient the prescription is at last dispensed. Now, this sort of thing is of frequent occurrence, and we obviously want urgently the adoption of some convention that in all such cases the first dispenser, who generally knows or can find out what the prescriber means, shall make a minute note of what he has done—say, just under his recipe-stamp—for the guidance of any and all subsequent dispensers who may care to secure uniformity by conforming to his practice as thus indicated. It is, of course, well known that in the eyes of the public the first compounder is always right. Naturally, the patient having taken his stuff and survived cherishes a prejudice in his favour. The general adoption of the above simple rule would mean a substantial saving in time, prestige, and hard cash to all those engaged in pharmacy. It is earnestly to be desired that no slipshod work of any kind or unnecessary divergence from the prescription-directions be permitted. If uniformity is to be the real object, the methods of the laboratory must be applied as thoroughly as possible to the every-day shop-work. You cannot, for example, take the word of a bottle against the evidence of your graduated measure, and no mixture by volume will be quite right, and may be very wrong, if it be not made up to its ordered amount before being finally dispensed. The author next referred to 8-oz. bottles which hold only 7½ oz., and protested against the filtration of mixtures containing precipitates.

The last papers read were:—

Preparation of Hydrobromic Acid.

By E. M. Marshall, Glasgow.

In preparing hydrobromic acid the process usually followed is that described by F. W. Fletcher at the York Conference in 1881, which consists in passing sulphuretted-hydrogen gas into water containing bromine until the liquid is no longer red, and subsequent distillation of the hydrobromic acid from the sulphuric acid, the other product of the reaction. The author described some objections to the process, chief of which was, that if the sulphuretted hydrogen is allowed to pass directly into the bromine, 20 per cent. of the latter may be converted into the sulphur compound. With a view to further investigating the properties of sulphur bromide, experiments were carried out, of which the following is a summary:—

Sulphur bromide was collected as a by-product from Fletcher's process and distilled to purify. Bromine comes over, the temperature rising steadily until the thermometer registers 195° to 200° C., when it remains at this point for a time; sulphur now becomes evident, and the temperature rising rapidly, the latter body is left in the retort. The fraction distilling between 195° and 200° C. may be taken as pure sulphur bromide. Its sp. gr. is 2·4, bromine having a gravity of 3·18; the fumes given off at ordinary temperatures smell somewhat sulphurous, and a current of air blown through the liquid suffices to entirely decompose it, bromine being removed.

Sulphur and bromine dissolve in it, approximating in each instance towards the properties of the element in excess. The body can be made most conveniently by adding sulphur in the proportion of 2 parts to 5 parts by weight of bromine, a small amount of heat being evolved during the combination.

Its colour, a beautiful red, soon becomes dull when water is added, owing to the precipitation of sulphur. The reaction was described in detail by the author. It results, ultimately, in formation of hydrobromic acid, sulphuric acid, and free sulphur. The sulphur dissolves in the sulphur bromide, rendering the conversion of the last of the bromine into hydrobromic acid rather slow, the water having some difficulty in penetrating the plastic mass; but, on standing for a short time, it becomes solid enough to be broken up, when the reaction soon finishes.

With the view of simplifying the process of manufacturing hydrobromic acid so that all interested might be able to distil it for themselves, numerous experiments were undertaken in order to work out a formula, based on the foregoing reactions, which would give good results in practice, and would at the same time obviate the difficulties at present experienced in making the acid.

A small amount of hydrobromic acid is first made by means of sulphur bromide and water; the acid liquid is poured off from the sulphur into a suitable vessel and bromine added, preferably from a separating funnel delivering below the surface of the liquid. The bromine dissolves, it being very soluble in this acid. The liquid is stirred, or otherwise agitated, and a very small amount of sublimed sulphur added; combination at once takes place, and the liquid becomes clear.

$$3Br + S + 4H_2O = 6HBr + H_2SO\ .$$

More bromine is now added, and the agitation continued, sulphur being added when the liquid shows the presence of free bromine. The action goes on rapidly until the liquid has a sp. gr. about 1·61, when an equilibrium is maintained between the sulphuric and hydrobromic acids, the process tending to work backward, and gave rise to free bromine and SO_2.

$$2HBr + H_2SO_4 = Br_2 + SO_2 + 2H_2O.$$

The liquid is now distilled twice, when a pure, colourless acid of 40-per-cent. strength is obtained; on dilution, 1 to 3, it forms the B.P. acid.

Care should be taken that no sulphur bromide enters the distilling flask, otherwise free sulphur will distil and contaminate the hydrobromic acid with sulphurous and sulphuric acids. A small amount of the acid is kept back in the generating vessel, and the original operation repeated. Experiments prove that 1 oz. of sulphur is capable of converting over 17 oz. of bromine into hydrobromic acid. Reckoning the acid as 40 per cent., it constitutes a little over 90 per cent. of the bulk of the liquid formed, about 9 per cent. being sulphuric acid, from which the former is separated by distillation.

The experiments in connection with this paper were carried out in the laboratories of Brown Brothers & Co., Glasgow.

The B.P. Santonin Test.

By Percy Pain, Ph.C.

The B P. test for santonin is, "added to warm alcoholic solution of potassium hydroxide it yields a violet-red colour." Many other substances give a similar reaction, and a comparatively large amount of santonin is required to produce any decisive colour; therefore the author suggests a test more certain and sensitive. A few crystals of santonin warmed in a test-tube with 2 or 3 c.c. of solution of ethyl nitrite gives a fine rose-red colour on the addition of a few drops of potassium hydroxide. No colour is produced till the addition of the potash solution—a distinction from aloin and resorcin—both of which give a red colour with solution of ethyl nitrite, intensified on the addition of potash solution, whilst thymol with the same test yields a dark-yellow solution.

There was a bright little spar between Mr. Tyrer and Dr. Attfield as to the best process for making hydrobromic acid; and Mr. Naylor and Mr. Maben spoke in admiration of the work in the papers.

The theatre was now crowded with the wanderers, and the final business commenced.

The Bell and Hills Fund Gift.

The President, again rising, congratulated the Conference on the success of its meetings in Dublin. The Conference had visited many cities and places, they had carried away many pleasant recollections, and made many friendships, which they carried with them through life. To mark those visits, and by the generosity of a former member of the Conference, they presented a series of volumes of books from the Bell and Hills Fund. On this occasion he had great pleasure in handing the ten volumes before him over to the President of the Pharmaceutical Society of Ireland as a token of gratitude for the pleasant visit to Dublin. (Loud applause.)

Mr. G. D. Beggs (President of the Pharmaceutical Society of Ireland), in accepting the books, said he did so with feelings of deep gratitude. He accepted the care of the valuable volumes, and he need hardly say that they would be placed in the library, and that all access for students would be given to them. He hoped they would be thoroughly perused and be a service to the members of the Pharmaceutical Society of Ireland. (Loud applause.)

Formulary Committee.

On the motion of Mr. Wardleworth, seconded by Dr. McWalter, the following committee was appointed:—N. H. Martin, W. A. H. Naylor, A. C. Abraham, J. C. Bird, Peter Boa, W. Martindale, F. Ransom, Dr. Symes, Harold Wilson, R. Wright, H. Wilson, and W. F. Wells.

The Next Meeting-Place.

Mr. Charles Kerr (of Dundee) said that in London last year he was the medium of conveying an invitation to the

Conference to meet in Dundee in 1902; and along with some friends he had been deputed to come to Dublin and renew that invitation to visit Dundee next year. (Applause.) Should the Conference accept the invitation, they in Dundee would do their utmost to make the visit a pleasant one. He would not make rash promises, because from what he had seen in Dublin he had got a little nervous as to what they would be able to do in Dundee; but he would say this: that they in Dundee would put a "stoot heart to a stey brae," and endeavour to make the Conference at Dundee a great success. (Hear, hear.) It was thirty-four years since the Conference met in Dundee. At that time the Conference was in its youth, as the small *Year-book* published in that year of 1867 showed when compared with the huge volume now published. (Hear, hear.) He might say that it was in Dundee the first photograph of the Conference was taken, and he was much struck on looking at it recently to find how many of those who were present at Dundee in that year had gone to their rest since. Those now present who were in Dundee in '67 would be surprised at the strides the town had made since then. It would be quite an object-lesson to see what a City Council could do with a very "wee" body of ratepayers. (Laughter.) They had cleared away old streets and built new ones; they had electric cars and electric light—in fact, Dundee was up to date in every sense of the word. (Hear, hear.) It was the third town as regarded population in Scotland, and it was known in history long before Glasgow. (Laughter.) Yes, it was certainly much more ancient. (Laughter.) Dundee was also celebrated for its manufactures, the principal of which was, of course, jute; and who had not heard of Dundee marmalade? (Laughter.) Then they were in the centre of the whale-fishery, and one of their valuable products was whale oil. (Laughter.) The ladies would be glad to know that in Dundee they were great manufacturers of sealskin jackets. (Laughter.) Then they could show visitors the Tay Bridge, the longest bridge in the world; and they could visit St. Andrews, where they formerly burned heretics—(laughter)—but only now played golf; Kirriemuir, so well known to readers of J. M. Barrie's "Thrums"; and see the Grampian Hills, where Norval's father fed his flocks. (Laughter.) He did hope that many of their Irish friends would come to Dundee on the occasion. (Applause.)

Mr. Naysmith (Arbroath) said it gave him the greatest pleasure to endorse the remarks that had fallen from Mr. Kerr, the late President of the Forfar Chemists' Association, who had done good work for the Association during his presidency. As representative of the Forfarshire Association, he (Mr. Naysmith) would say that it would give them the greatest pleasure to see the Conference meet in Dundee next year. (Hear, hear.) There were about one hundred chemists in Forfarshire, and out of that number he believed fully sixty were members of the Association. (Hear, hear.) That showed the pharmacists of Forfarshire were loyal not only to themselves, but to the Pharmaceutical Society, for it was only by such loyalty that the Pharmaceutical Society could exist. (Hear, hear.) Well, Mr. Kerr had spoken of the beauties of Dundee. It was beautiful, he admitted; but he would say to those who would feel dissatisfied with Dundee on that score, let them pay a visit to Arbroath, and they would be well satisfied. (Laughter and applause.) As he promised them last year in London, if they came to Dundee and Arbroath, they might feel assured of receiving a hearty Scotch welcome. (Applause.)

Mr. Umney said that last year he, at the London Conference, proposed a resolution that the invitation to visit Dublin in 1901 should be accepted; and, judging by the reception they had got and the enjoyment they had had, he thought he had acted rightly in so doing. (Applause.) In the same way he thought that by now proposing that the Conference accept of the invitation to visit Dundee he would be voicing the opinion of the members. (Hear, hear.) The last Conference in Scotland was in Aberdeen fifteen years ago, and as they had been twice to Ireland since, he thought it was due to Scotland to get the next visit. (Hear, hear.) He hoped they would see at the Conference in Dundee many of their Irish friends. (Applause.)

Sir Thomas Robinson seconded the motion to hold the next Conference in Dundee. From what they had heard it was a place of colossal possibilities. (Laughter.) They had the largest bridge in the world; they dealt in whales—(laughter)—and the male members might not like the prospect of the sealskin jackets, although it would no doubt be pleasing to the ladies. (Laughter.) He thought Mr. Kerr would like to make out that Dundee was a greater "D" than Dublin. (Laughter.) In any event, he thought a good number of Irishmen and Irishwomen would go over to the Conference at Dundee, because they certainly loved the Scotch people a good deal better than they did the English. (Laughter.)

The President then put the motion—

> That the Conference visit Dundee in 1902

—which was passed by acclamation.

Mr. Ransom then read

The List of Officers

for the ensuing year, as follows:—

President.

G. C. Druce, M.A., F.L.S., Oxford.

Vice-Presidents.

G. W. T. Newsholme, F.C.S., Sheffield.
G. D. Beggs, M.P.S.I., Dalkey.
Chas. Kerr, Dundee.
W. A. H. Naylor, London.

Treasurer.

John C. Umney, F.C.S., London.

Hon. General Secretaries.

F. Ransom, F.C.S., Hitchin. | E. S. Peck, M.A., Cambridge.

Hon. Local Secretary.

W. Cummings, Dundee.

Other Members of the Committee.

Leo Atkinson, London.
H. Collier, London.
E. H. Farr, F.C.S., Uckfield.
C. T. Tyrer.
W. F. Wells, Dublin.
J. I. Bernard, Dublin.
Professor Greenish, F.I.C., F.L.S., London.
Patrick Kelly, Dublin.
W. Warren, London.

Auditors.

G. H. Grindley, Dublin. | James Russell.

Editor of the "Year-book."

J. O. Braithwaite.

The President put the motion to the meeting, and it was carried with acclamation.

Mr. Naylor's Retirement.

Mr. Martin then proposed the following resolution:—

> That the members of the British Pharmaceutical Conference regret to find that, through a combination of ill-health and irresistible claims to his time in other directions, Mr. Naylor is obliged to tender his resignation as Senior Secretary of the Conference, and the members offer to him their deepest thanks for his long and valuable services.

He said they all knew that the smooth working of the British Constitution was due very largely to the permanency of the Civil servants, and in that respect the British Pharmaceutical Conference has been peculiarly fortunate. During the thirty-eight years of its existence, the Conference had had eight Hon. Secretaries, and of these two of the Hon. Secretaries had covered thirty-two out of the thirty-eight years. (Applause.) Amongst all the able men they had had, who had done yeoman service for the Conference, Mr. Naylor stood out prominently, and Mr. Ransom (who had now become Senior Secretary) had served eleven years in the position, so that he would be able to take up the reins which the chief driver, Mr. Naylor, would now hand over. (Hear, hear.) Mr. Ransom would be helped by Mr. Peck (the new Secretary), whom they all welcomed. (Applause.) He (Mr. Martin) could not give the Conference any adequate idea of the character of Mr. Naylor. For fifteen years on the Formulary Committee he knew the great workman Mr. Naylor was. He could scarcely exaggerate the good qualities of Mr. Naylor, and he would say this much—that he was the most unselfish pharmacist he had ever known. (Applause.) He did his work in an open, honest, careful manner; and what more could a man do. There was no *arrière pensée*, nothing at the back of Mr. Naylor—(hear, hear)—and he always gave to the Conference the benefits of his knowledge to the full of his ability.

(Applause.) One of the things that contributed to the success of the Conferences was that Mr. Naylor had been so loyal to the principles of the constitution of the Conference—(hear, hear)—and in this way he had sometimes kept members from treading on the dangerous ground of politics or commercialism at the Conference meetings. (Hear, hear.)

Dr. Attfield, in seconding the resolution, said they had seen how severe were the labours and services of the Hon. Secretaries at the annual meetings of the Conference. He could assure them that for the past fifteen years during which Mr. Naylor had been Secretary the work of the Conference and its organisation had depended more largely upon him even than upon his colleague. What was he to say of the intervals between the meetings? He could assure them that in regard to Mr. Naylor the meetings were as the visible capitals of the invisible columns of the labours during the intervals. He cordially supported the resolution, because he felt that no predecessor of Mr. Naylor had served the Conference better. In Mr. Ransom they had an able successor, and they had a worthy successor to the junior position in Mr. Peck; but he questioned if they would ever have a better Secretary than Mr. Naylor. (Loud applause.)

The President, in putting the resolution, said the Conference had been through rather a rough time during the past year. They had lost the Editor of the *Year-book* from ill-health, and when the threatened resignation of Mr. Naylor was brought to them it was with considerable shock and grief that they received it. The various qualities Mr. Naylor had brought to bear during the time he had been Secretary only those in close contact with him fully realised. The thought uppermost in his mind was the unselfish character of Mr. Naylor. His whole thought was the success of the Conference and the Conference success. That was the true test for a secretary. He must put his Society first and everything else afterwards, and Mr. Naylor had done that. (Loud applause.) He did not think they need fear for the future, as he was sure the Conference was in a much firmer position than it had been. They got from the Conference better ideas of pharmacy and the world at large. It was a bond of brotherhood which united pharmacy in its widest sense. It was the pleasure and duty of every member to thank Mr. Naylor for the work he had done in that direction, and for the hold he had upon them, and with that in his mind he put the resolution. (Loud cheers.)

Mr. W. A. H. Naylor was received with prolonged applause. He said it was a great pleasure and a great help to him to know that they received his resignation so joyously. (Laughter.) He had the intimation given him that this might be a time for tears, and certainly if it had been it would have been quite impossible for him to control his emotion. (Applause.) It was impossible to thank them adequately—to try to do so would simply beggar the language of an angel—for all the kind sentiments which they had expressed to him to-day, for the countless acts of favour, for the measureless confidence that they had reposed in him year after year for a prolonged period, and for the unfailing sympathy and support which had ever been accorded him. For these things he thanked them most sincerely and most heartily. It was under the transfiguring influences of these kindnesses that in whatever services he had rendered he had been able to lose the duty in the joy. (Applause.) He did this day before them remember his faults, and that they had been pleased to throw over them the cover of a large forgetfulness, and for that he was doubly grateful. (Applause.) He did not wish to claim credit for himself. The Secretaryship had been a joint one, and no man could have been blessed with a more genial, more considerate, loyal, business-like, and long-suffering —(laughter)—colleague than he had in Mr. Ransom. And when his heart had failed, and Mr. Ransom himself had been depressed, then the inspiring spirit and the bright, sunny face and smile of Mrs. Ransom had cheered them. He thanked them most heartily. (Cheers.)

Mr. J. R. Hill then moved a vote of thanks to the Local Committee, and referred to the splendid success of this meeting. Referring to the hearty welcome given to the members, he said that he had the authority of London members in saying that Dublin was not the second city of the Empire, but the first, in hospitality. (Hear, hear.)

Mr. Henry Gadd seconded the motion, which was heartily accorded with "Ay, ay, ay," and Kentish fire.

Mr. Wells, acknowledging the vote, said he felt quite overcome at the way in which the vote had been given. Although there was a good deal of trouble in arranging for such a meeting, there was a good deal of compensation. He expressed his appreciation of the way in which the members of the committee had helped in all the work.

Mr. Bernard, responding to the calls for him, said he supposed the reason he was thanked was that he had not inflicted speeches upon them. (Laughter.)

Mr. Beggs also spoke two graphic sentences of thanks.

On the motion of Mr. Brodie, seconded by Mr. Pidd, a cordial vote of thanks was accorded to the President and Council of the Royal Society of Dublin and Mr. Moss for all that had been done for the comfort of the Conference.

Mr. R. J. Moss, briefly acknowledging the vote, said he hoped the Conference would come back again at a shorter interval than a quarter of a century.

Mr. Albert Cooper proposed a vote of thanks to the Lord Mayor of Dublin for the use of the Mansion House, which Mr. Kemp seconded, and it was promptly passed. A similar vote was accorded to the Science and Art authorities for the use of the Museum. When Dr. Symes and Mr. Payne had submitted a motion of thanks to the President, which Mr. Druce acknowledged, the meeting adjourned at exactly 5 p.m.

SOCIALITIES.

The Luncheon on Tuesday was served in the large cir- banqueting-room of the Mansion House, which the Lord Mayor of Dublin had placed at the disposal of the Executive. There the ladies rejoined the members who had been attending the opening session, and there was a large and animated gathering when luncheon was served, the bright dresses of the fair sex giving a distinct tone to the assembly. Mr. W. F. Wells, immediately on the conclusion of lunch, proposed the toast of "The King," describing it as a toast which had never before been proposed at a Pharmaceutical Conference. They had realised that his mother was not only a true woman but a great Queen, and they now saw that her illustrious son was likely to follow in her footsteps. The toast was given with musical honours. Mr. Wells, again rising, proposed the toast of "The President," and, referring to the excellence of the address he had given them that morning, said that Mr. Druce excellently combined great scientific attainments with those so necessary to an everyday pharmacist. The toast was received enthusiastically, the company rising and singing "For he's a jolly good fellow."

* * * *

The Electric Power Station.—By the courtesy of the directors of the Dublin United Tramway Company the members of the Conference were permitted to inspect the chief power station of the city. Conducted by the engineer in charge, who seemed to possess in a high degree the power to communicate, the members were initiated into many mysteries of electric generating plant. Everyone was struck by the neatness of the establishment and the peculiarly ingenious devices for conserving material and energy. Though the number of boilers is very large, all the stoking is done by two men through the medium of mechanical stokers, and the apparatus for saving and cleaning the water after use called for the admiration of the visitors. The Bundy steam-trap for separating and removing oil from steam was practically explained. The generating, transforming, and distributing machinery was in turn shown, and described in sufficiently popular terms. The easy and quiet motion of the large masses of mechanism was favourably commented on, and the members of the Conference left the station with a deepened sense of the enormous possibilities of what is the coming power.

* * * *

Tuesday Afternoon's Drive to Dalkey was made on special electric cars which left Merrion Square, passed through the townships of Blackrock and Kingstown, along the lovely road to Dalkey. Leaving the cars at the terminus, the company walked to Sorrento grounds, where, by permission of Lady Overend, tea was served. After a delightful tea, the company broke up into groups, some strolling round the beautiful grounds and some walking or driving to the summit of Victoria Hill, Killiney. From this eminence a magnificent view is obtained of the Wicklow Mountains, Bray Head, Little Sugar-loaf, and the entire sweep of Dublin Bay. In the evening the band of the 4th Battalion of the Rifle Brigade played a selection of music in Sorrento Park. Unfortunately the rain began to come down about 8.30, when the band was rendering some Irish airs which seemed all the more delightful on account of the environment, and soon the cars were rushed for.

* * * *

It did not require a philosopher to note that the rain was unheeded by many of the members and their companions; the cosy seats under bushes were enough for them. It is said in Dublin that more engagements are made in the Sorrento Park than in any other part of the kingdom, and that Mr. Beggs, through the ingenuity which he has displayed in devising situations for garden chairs and things of that kind, has shown gifts as a matrimonial agent equal to those which he has displayed as a Pharmaceutical Councillor.

* * * *

Those who went to Sorrento Park missed a good string-band concert on the staircase of the Shelbourne Hotel. The previous evening, in the drawing-room of the hotel, there was an *impromptu* entertainment, to which Mrs. Theodore Wright contributed "Honeymoons."

* * * *

After Luncheon on Wednesday Lafayette took four photographs of the members, who grouped themselves in the Mansion House garden. The Dublin Ladies' Committee was afterwards photographed. Several pleasant social functions marked the conclusion of serious work. An editor is no more able than Sir Boyle Roche's bird to be in two places at once, so we must content ourselves with a reference to the exquisite dinner given by Mr. and Mrs. Frank J. Gill, Apollinaris agent, to the Conference President and a few friends, including Sir Thomas and Lady Robinson, Mr. Edward Evans, Mr. Naylor, Mr. and Mrs. Wells, Mr. and Mrs. Beggs, Mr. and Mrs. Bernard, Mr. and Mrs. Payne, and others. "The King" and "The Guests" were the toasts. Mr. Druce and Mr. Evans replied for the latter; and Mr. Evans gave the health of host and hostess.

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The Drive on Wednesday was all that was prophesied for it. The concerts were brilliant functions. In the Shelbourne Drawing-room Mrs. Wells presided, and the gathering gave the lie to decadence in pharmacy. The word should be *revenesco*, as so many charming and fashionably costumed women surely embody prosperity. Those who sang or played were Miss Grindley (the ladies' Secretary), Miss Ethel Varian, Miss Gibson (Edinburgh), Miss Brien, Mrs. Brien, Mrs. Figgis Johnson, Mrs. Rait, Mr. Wells, Professor Tichborne, Mr. Church, and Mr. Currie. Mr. Thomas Tyrer and Mr. John Murrey presided at the piano. At the smoking-concert downstairs Mr. Beggs made a go-ahead chairman. There the ball was opened by Mr. Currie (Glasgow) with "A Wee Drappie o't," and Professor Tichborne followed with a 'cello solo; Mr. Vincent McWalter, Dr. Walsh, Mr. Patrick Kelly, and others paved the way for a splendid duet by Miss Gibson and Mr. Wells; and later Mrs. Wright excelled herself in her rendering of "Similar Causes; or, Prehistoric History," which was *à propos* of the President's geology. The attendance was within six of the London meeting of last year. The end was as good as the beginning, and the whole meeting a record.

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At Luncheon on Wednesday Mr. Wells was supported on the right by the President of the Conference, and on the left by Mr. Alderman Hennessey, Deputy Lord Mayor of Dublin. After the toasts of "The King" and the "Queen Consort," the Chairman gave the health of the Lord Mayor of Dublin, and returned thanks to him for his great kindness in granting the use of the Rotunda room for the luncheons. Mr. Alderman Hennessey warmly but briefly replied. Mr. Wells, in subsequent announcements as to future proceedings, stated that through the kindness of Mr. Alderman Hennessey, who is Chairman of the Dublin Fire Brigade Committee, there was to be a demonstration of the Brigade on Friday morning for the benefit of the visitors.

THOSE WHO WERE THERE.

The following are the names of members and visitors who signed the attendance register at the Conference meetings:—

Abraham, T. F., Liverpool
Alexander, A., Liverpool
Alexander, J., Waterloo
Allen, W. N., Dublin
Anderson, A. B. and Mrs., Dundee
Anderson, J., Dundee
Armstrong, P., Dublin
Ashe, J. S., Dublin
Ashton, F. W., Hitchin
Attfield, John, London
Baker, C. F., Calcutta
Barge, J., Plymouth
Bayley, Mr. and Mrs., Shipley
Bayne, T., Edinburgh
Beggs, G. D. and Mrs., Dalkey
Bernard, Mr. and Mrs., Dublin
Bird, F. C. J., London
Bourdas, J., London
Bourne, J. W., London
Boyers, H., Sligo
Bremridge, R., London
Brewis, E. T., London
Brodie, R., Glasgow
Brown, Geo., Dublin
Bruuker, J. E., Dublin
Burkey, J. C., Belfast
Buxton, Mr. and Mrs., Clifton
Campbell, Mr. and Mrs., Dublin
Chandler, J., Bristol
Church, E. N., Cambridge
Clarke, R. F. and Mrs., Gravesend
Clarke, W. J., Stockton-on-Tees
Clementi, Miss, Manchester
Clinton, B. R., Dublin
Collis, A. F., Bath
Connor, Mr. and Mrs., Dublin
Conyngham, H., Dublin
Conyngham, W., Dublin
Conyngham, W. B., London
Cooper, Albert, London
Cowie, W. B., Edinburgh
Cowley, R. C., Liverpool
Cummings, W., Dundee
Currie, W. L. and Mrs., Glasgow
Cresswell, F., London
Davies, J. T., Swansea
Doran, A. L., Dublin
Doran, Teresa, Dublin
Druce, G. C., Oxford
English, Bessie M., Dublin
English, T. G., Dublin
Evans, Chas., Dublin
Evans, Edward, jun., Liverpool
Evans, J. H. E., Liverpool
Evans, Kenneth, Liverpool
Everson, Mr. and Mrs., London
Fielding, P. J. D., Cork
Foggan, G., Bedlington
Gadd, Henry, Exeter
Gibson, A., Edinburgh
Gibson, Ada, Edinburgh
Gibson, Mr. and Mrs., Wolverhampton
Gibson, W. J., Belfast
Gibson, Miss, Belfast
Gill, F. J., Dublin
Goldon, H. V., Birr
Grimes, H. C., Dublin
Grindley, M. H., Dublin
Grindley, R. G., Dublin
Hall, H. E., London
Hanson, A., Bradford
Hanson, A. W., and Mrs., Sidcup
Hardy, J. N., Dublin
Hardy, W. J., Belfast
Harris, E. W., Merthyr Tydvil
Hearn, J., London
Hill, Alex., Canada
Hill, J. Rutherford, Edinburgh
Hobbs, A. E., Tunbridge Wells
Holloway, J. and Mrs., Carlisle
Howie, W. L., London
Hughes, J., Swansea
Hunt, H., Dublin
Ingram, Mr. and Mrs., Johannesburg
Irvine, Mr. and Mrs., Glasgow
Jackson, J. J., Hereford
Johnston, J., Aberdeen
Johnston, L. B., Dublin
Johnston, W. V., Dublin
Johnstone, C. A., Manchester
Jones, W., Dublin
Kay, J. P., Aberdeen
Kelly, Mr. and Mrs. P., Dublin
Kelly, T., Dublin
Kemp, Mr. and Mrs., Manchester
Kerr, Chas., Dundee
Kilpatrick, Mr. and Mrs., Glasgow
Kyle, Margaret, Dublin
Lake, R. Hinton, Exeter
Lawton, A., Hulme
Lenehan, J. J., Rathgar
Luxton, F., Exeter
Maben, T., Glasgow
MacEwan, Peter, London
McKnight, R. W., Dublin
McMillan, J. and Mrs., Glasgow
McWalter, G., Dublin
McWalter, J. C., Dublin
Mair, Wm., Edinburgh
Martin, N. H., Mrs., and Miss, Newcastle-on-Tyne
Meyrick, H. C., Drogheda
Mills, A., Leeds
Milton, T. C., Exeter
Moffitt, T. N., Belfast
Montgomery, R., Dublin
Moore, W., Assam
Naylor, W. A. H., London
Naysmith, A. and Mrs., Arbroath
Nicholl, J. N., Belfast
O'Dwyer, R. J., Dundee
Parkinson, F. W., Atherstone
Payne, J. C. C. and Mrs., Belfast
Peck, E. S., Cambridge
Pettinger, E., London
Phillips, J. and Mrs., Wigan
Pidd, W., Manchester
Pidd, Miss, Manchester
Poole, J., Birmingham
Poole, T., Craven Arms
Power, F. B., London
Prescott, A., Anu Arbor, U.S.A.
Ramsay, E., Dundee
Ramsay, W. C., Dundee
Ransom, Mr. and Mrs., Hitchin
Rees, R. P., Dowlais
Regan, D. T. W., Birr
Reid, Miss, Falkirk
Robertson, Mr. and Mrs. G., Glasgow
Robinson, R. A., London
Robinson, Sir T. W., Kingstown
Robinson, W. P., London
Russell, J., Dundee
Sangster, A., London
Silson, R., Bradford
Simpson, H. D., Louth
Simpson, R., Dublin
Smith, J., Dublin
Stafford, R., Atherstone
Stockwell, Miss, Glasgow
Strongitharm, W. G., Kingston
Swinton, E., Bootle
Swinton, T. H., Bootle
Symes, Dr. and Mrs., Liverpool

Taylor, G. S., London
Thompson, C., Birmingham
Thompson, S. J., Belfast
Tichborne, C. R., Dublin
Twinberrow, J., Worcester
Tyrer, Thomas, London
Umney, J. C., London
Vinden, H. J., Exeter
Walsh, Dr. and Mrs., Dublin
Want, W. P., London
Wardleworth, T., Liverpool
Watson, D. M., Dublin
Weld, J. C. C., London
Wells, W. F., and Mrs., Dublin
Wells, Misses, Dublin
Weston, S. J., London
White, E., London
White, T., Dublin
Wild, J., and Mrs., Manchester
Woollcombe, R. L., Dublin
Wyatt, W. J., Bandon
Yates, J. G., Blackburn

THE GLENDALOUGH EXCURSION.

As we close for press a telegraphic message reaches us that the Thursday Conference excursion has been favoured with magnificent weather. The party walked down the Devil's Glen, where cars were waiting to convey them to Glendalough, which was reached at 2.50 P.M., after a most enjoyable drive.

Federation of Associations.

THE annual meeting of the Federation of Local Pharmaceutical Associations was held on July 31, in the Royal Hibernian Hotel, Dublin. Mr. E. Saville Peck (Cambridge) presided. Mr. G. F. Merson (Hon. Secretary) read the annual report, which states there has been no burning question of pharmaceutical importance brought under consideration since the last annual meeting; nevertheless the work done, the committee venture to think, is of no inconsiderable moment, and they feel sure that their efforts to promote increased interest in matters pharmaceutical are being crowned with success. The instruction given last year regarding the question of titles and sale of poisons has been kept fully in view by the committee, and circulars were sent to the Secretaries of all known local Associations (whether affiliated or not) with a request that they should take steps to have the questions appended submitted to the Parliamentary candidates in their several divisions, and report for the use of the Executive Committee. These circulars were eminently successful, and in only one or two instances were the replies other than most satisfactory. The suddenness of the General Election precluded a complete canvass of candidates, but the results achieved showed conclusively that concerted action in a matter of this kind can be made most effective. The new scheme of the Pharmaceutical Society for the appointment of Divisional Secretaries received due attention, and many nominations were, through the agency of the Federation, sent forward for districts which would otherwise have been unrepresented. Nine additions to the roll of affiliated Associations have been made during the year, and there have been three withdrawals during the year—Inverness, Brighton, and N.E. Lancashire. North-East Lancashire have withdrawn their support on the ground that "the Federation is not performing useful work."

The Treasurer's report showed contributions from the federated Associations of 20*l.* 14*s.* 6*d.*, and, after paying expenses, a balance of 1*l.* 6*s.* 9*d.* remains in hand.

The annual report and statement of accounts were adopted on the motion of Mr. Silson, seconded by Mr. Swinton.

The officers for the past year were re-elected, with Mr. John Smith as Chairman and Mr. George F. Merson as Hon. Secretary.

Mr. Kay (of Aberdeen) read, in the absence of Mr. Paterson (Aberdeen), an interesting paper on the subject of "Provincial Schools of Pharmacy: Hints for their Establishment and Support." Mr. Silson (of Bradford) introduced the subject of "The Prescribing of Compressed Drugs," but the meeting took no action on the same.

Outings.

COMBINED EXCURSION.

The Newcastle and District Chemists' Association and the Sunderland Chemists' Association both held their annual outing at Hexham on July 24. At the Royal Hotel, where dinner was served, there were over seventy present, and, under the guidance of Mr. John Gibson, F.C.S., of Hexham, the party drove in brakes to Warden, where Mr. Gibson pointed out the interesting features in connection with St. Michael's Church. Thence Chollerford was visited, and a pleasant time spent. Driving back to Hexham, tea was partaken of at the Royal Hotel, with Mr. Charles Ridley, the popular and genial President of the Newcastle Association, in the chair. He was supported by Mrs. Ridley, Mr. H. J. Turnbull (President of the Sunderland Association), Mrs. and the Misses Turnbull, and amongst others Mr. R. Wright (President-elect), Newcastle; Mrs. Wright and Miss Wright, Mr. R. W. Bell (Vice-President), Sunderland; Mr. A. W. Golightly (Hon Secretary), Sunderland; Mr. Mitchinson (Hon. Treasurer), Sunderland; and others.

After tea the Abbey Church was visited, Mr. Gibson again being in command. The day being fine, the outing proved most enjoyable.

PILL MEN MAKE MERRY.

On July 27 the firm of Messrs. A. H. Cox & Co., pill-manufacturers, Brighton, took their annual outing. The heavy rains overnight had left the roads in splendid condition, and the party proceeded by road in a four-horse brake and several cabs, a few stragglers coming on by rail later. The destination was Scayne's Hill, a picturesque village lying between Haywards Heath and Sheffield Park. They arrived midday, when a cricket-match was arranged between married and single, the result being disastrous for the former. At 1.30 lunch was served at the Anchor Hotel, when the healths of the principal (Mr. Alderman Cox) and that of his two sons (Messrs. A. H. Cox and E. E. Cox), now managers of the business, were proposed. At 5.30 tea was provided, and soon after a start was made for home, Brighton being reached at 10.30.

SPORTS AT LEATHERHEAD.

Delightful weather favoured the annual trip of the employés of Messrs. Willow, Francis, Butler & Thompson on July 27. The neighbourhood chosen was Leatherhead. The first item on the programme was a cricket-match, Office *v.* Warehouse, which finished in favour of the warehouse by five runs with just two minutes before time; a sack and three-leg race followed. About forty sat down to an excellent dinner. Mr. Thompson proposed the health of the firm, and Mr. H. J. Willows gave the toast "Employés." A smoking-concert wound up a most enjoyable day, the chair being taken by Mr. H. J. Willows.

Trade Notes.

"PINK TOPS."—Mr. E. J. Reid, 11 Dunedin House, Basinghall Avenue, E.C., sends us a sample-bottle of phenalgin, put up in capsules. The capsules are long-shaped gelatin ones, with the half forming the lid of a pretty pink colour, thus making a striking contrast to the lower half, which simply shows the white colour of the phenalgin. This accounts for the popular name of "Pink Tops." Physicians are asked to order them as "Phenalgin in Capsules, Rubræ et Albæ." Each capsule contains 5 gr. of phenalgin, and the capsules are sent out in 1-oz. bottles.

ERASMIC PREPARATIONS.—We have had an opportunity of inspecting some of the newer styles in which the Erasmic toilet articles are put up. Each cake of the five kinds of Erasmic soap—"Peerless," "Elite," "Savon de Luxe," "La Belle," and "De Luxe Royal"—is placed in a handsome wrapper, in various distinctive colours and designs. The newest perfume which the Erasmic Company have brought out is the "Gaiety," which is packed in round bottles, each bottle in a case, and sells at 1*s.* 6*d.*, 2*s.* 6*d.*, and 4*s.* 6*d.* a bottle. Other recently introduced goods are Erasmic herb-powder, put up in boxes of a dozen flat packets, selling at 2*s.*; Erasmic shaving-stick (1*s.*), in celluloid cases; and Erasmic shaving-pots. All Erasmic preparations are subject to a bonus in consideration of adherence to non-cutting prices. The new list tells all about these goods, and can be had on applying to 117 Oxford Street, W.

Legal Reports.

High Court Case.

Altering the Trade-mark Register.

In the Chancery Division of the High Court of Justice on July 26 Mr. Justice Cozens-Hardy had before him an application on behalf of the proprietors of the registered trade-mark of Holbrook & Co. for leave to alter the register of trade-marks. Mr. J. C. Graham, for the applicants, said the original owners of the mark, which was used in connection with a well-known sauce, were the Birmingham Brewery Company, and it was now proposed to carry on the sauce business as Holbrooks (Limited). It was accordingly proposed to leave out the words "and Co." from the trade-mark, and insert "Ld." The mark had been on the register since 1888, and the proposed alteration did not remove any essential part of the mark. Mr. R. J. Parker, who appeared for the Comptroller of Trade-marks, said it had been long ago decided that where the word "Limited" was inserted as part of a name in a trade-mark it could not be used by the letters "Ld.," but must be spelt in full.

Mr. Justice Cozens-Hardy said he could not depart from the rule laid down by the Courts, and he could only allow the petitioners to alter the mark by using the word "Limited" in full in place of "and Co."

Sale of Food and Drugs Acts.

Tincture of Benzoin.

The adjourned summons (*C. & D.*, July 6, page 24) against Frederick K. Barlow, chemist and druggist, Balsall Heath Road, Birmingham, for selling tincture of benzoin which was alleged not to meet the requirements of the B.P., was heard at the Birmingham Police Court on July 26. Mr. G. V. Hiley, Deputy Town Clerk, appeared to prosecute, and Mr. Guy Pritchard (on behalf of Mr. Beck for the P.A.T.A.) was for the defence. On the last occasion the certificate of Dr. Alfred Hill, the city analyst, was put in. It was to the effect that the sample of tincture sold by the defendant contained only 82 per cent. of the solid ingredients required by the B.P. An adjournment was granted in order that another portion of the sample might be sent to Somerset House for independent analysis. Mr. Hiley now applied for a further adjournment, remarking that as the certificate received from the Inland Revenue officials was at variance with that given by Dr. Hill, the Health Committee should have time to consider what course they should take. Mr. Brame (one of the Magistrates) read the certificate from Somerset House, which said: "In our opinion it (the sample) bears no evidence of being below the strength of the compound tincture of benzoin made according to the particulars prescribed in the British Pharmacopœia." He said that if the testimony of Somerset House was to be accepted as final he could not see how it was possible to carry the case further. Mr. Hiley said that of course the decision of Somerset House was not final under the Act, although in practice it amounted to that. It was rather an important thing that the city analyst's certificate should differ from the findings of Somerset House, and required some consideration. He failed to see how anybody would be inconvenienced by a further adjournment. Mr. Guy Pritchard opposed the application, and submitted that upon the certificate from Somerset House the defendant was entitled to a dismissal of the summons. Mr. Brame said the certificate from Somerset House was positively conclusive. If there had been any hesitation expressed on it there might have been some ground for the application for adjournment, but in his opinion the case came to an end with this certificate, adding that whilst his colleague and himself were desirous of helping the Health Committee in every possible way, it did not appear to them to be just to the defendant, or fair in any way to go any further with the case, having regard to the conclusive nature of the certificate from Somerset House. Mr. Hiley said that in the circumstances he would withdraw the summons. Mr. Pritchard applied for costs, pointing out that the independent analysis had cost the defendant half-a-guinea. The Magistrates allowed this, and, in addition, a guinea solicitor's fee.

Lime-water and Gregory's Powder.

Henry W. Pound, described as a druggist, but whose name is not on the register, of Station Road, Harpenden, was summoned to appear at the St. Albans Divisional Sessions on July 20, for an alleged infringement of the Sale of Food and Drugs Act. Mr. W. G. Rushworth, inspector, of Watford, informed the Bench that in the first case Mr. Pound was alleged, under Section 6 of the Food and Drugs Act, to have sold lime-water 50 per cent. deficient in lime. Mr. C. S. Tucker, solicitor, of Harpenden, appearing on behalf of defendant, pleaded guilty, and asked the Bench to deal leniently with the case, on the ground that the deficiency was not injurious to health. Mr. Rushworth was then sworn, and said his samples, bought at defendant's shop, were submitted to the public analyst (Mr. Ekins, St. Albans), and the certificate showed it to contain lime to the amount of 0·25 of a grain to 1 oz. of water. The Pharmacopœia required that the proportion of lime-water should be $\frac{1}{2}$ gr. to each ounce of water. Another case was proved against Mr. Pound for selling Gregory's powder made with carbonate of magnesia in place of the oxide. The Bench fined Mr. Pound 1*l.* and 19*s.* costs in each case, making 3*l.* 18*s.* in all.

Almond Oil.

At Clerkenwell on July 31, Day's Metropolitan Drug Company, of Borough Road, S.E., was summoned by the Islington Borough Council for selling a drug which contained 100 per cent. of oil other than that demanded—viz., almond oil. Mr. Bramall prosecuted, and Mr. Le Breton was for the defendant. A plea of guilty was entered. Mr. Bramall said the oil served was a product of the kernels of peach and apricot stones. It was sold in a bottle labelled "Sweet almond oil." Almond oil was in the British Pharmacopœia, and was used for medicinal purposes. In no circumstances should such a product as this be substituted for it. The defence set up was that "peach-nut oil" had been served in error, owing to the general similarity of that product to almond oil. It was stated that the difference in price between the two oils was about 50 per cent. Mr. d'Eyncourt said he regarded this as a serious matter, and imposed a fine of 20*l.*, with five guineas costs.

County Court Cases.

Telephone Company *v.* Chemist.

On July 26, in the Westminster County Court, the part-heard case of the National Telephone Company *v.* Davis came before his Honour Judge Lumley Smith, K.C. The claim is for 12*l.* 17*s.* 6*d.*, telephone subscription from Messrs. John Morgan Davis & Sons, chemists, Coventry Street, W., and Bishopsgate Street Without, E.C. The case was started on June 19, and adjourned for amendment (*C. & D.*, July 13, page 57).

Mr. J. M. Davis now gave evidence. He said he wished to use the telephone for communicating with wholesale chemists and medical men, but instead of deriving any benefit from it he found it a nuisance, and that messengers were quicker. He could not call the attendant, as he had been killed in an accident. He did not know what the company meant by "no excessive disconnection," and had neither the time nor inclination to read the conditions on the back of the contract.

Mr. Jolly, solicitor, for the defendants, said a counter-claim had been filed, in which damages were claimed for the cost of messengers and other expenses incurred in consequence of the failure of the service.

His Honour asked if the Post Office contracts had such a lot of conditions as the company's.

Mr. Goddard: I understand they are rather worse, and you cannot sue the Postmaster-General.

His Honour came to the conclusion that the clause in the contract exempting the company from damages for faults meant only consequential damages, and he should give defendants 20*s.* damages on the counterclaim. On the claim he found for the company *plus* two days' costs.

Claim for "Soothers."

At the Clerkenwell County Court on July 29, before his Honour Judge Edge, Messrs. F. Krassa & Co., of 7 Wood Street Square, E.C., sued Mr. A. R. Godfrey, trading as the

Baby Soothing Manufacturing Company, of 31 Great Sutton Street, Clerkenwell Road, to recover the sum of 22*l.* 14*s.* 11*d.* in respect of goods sold and delivered.

The defendant's manager said he received from plaintiffs a consignment of babies' teats in November last. He bought them under the impression that they were made of indiarubber, but the greater part of them had gone wrong, with the result that he had lost a number of customers, who returned the goods as useless.

Mr. Hudson, an expert, said he had examined the teats, and found them to be of a rubber substitute, made of gelatin and gum. They were certainly not suitable for children, and in fact they were highly dangerous, inasmuch as they would be likely to divide after being in use a short time, and probably the children using them would be choked.

John Wilson, another expert, said the teats were made of indiarubber, but not Pará rubber.

His Honour said some of these goods were made of pure indiarubber, but there were other goods that were not pure. These were apparently made of rubber and a composition of something else. His verdict would be for the plaintiffs for the amount claimed, with costs.

A Chemist's Estate.

At the Staffordshire Assizes on July 24 the administrators of the estate of the late Thomas Wedgwood Massey, chemist and druggist, Fenton, brought an action against William Rhodes, earthenware-manufacturer, Wolstanton, to recover 581*l.* 5*s.* 6*d.*, the value of certain bonds which it was alleged defendant received from the late Mr. Massey, the defence being that the bonds were given to defendant by Mr. Massey prior to his death. After the evidence of the defendant the jury intimated that they did not wish to hear any more, and gave a verdict for the defendant. His Lordship said it was a very proper case for the administrators to bring forward, and he gave no costs.

Bankruptcies and Failures.

Failures of the Month.

According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the four weeks ended July 27 was 301, as against 365 in the corresponding four weeks of last year. The number of "chemists and druggists" who failed was seven, the same number as that reported in July 1900.

Re Ward and McMillan (Limited), aërated-water manufacturers, Edinburgh.—The statement of affairs shows liabilities 868*l.* 10*s.* 2*d.*, and a deficiency of 678*l.* 18*s.* 9*d.*. Among the creditors are the following:—

	£	*s.*	*d.*
Bratby & Hinchliffe (Limited), Glasgow	127	10	0
Bush, W. J., & Co., London	8	7	6
Carbonic Acid Gas Company, Low Elswick	2	16	0
Clayton & Jowett, Liverpool	7	0	0
Cooper, R., & Co., Portobello	31	9	4
Duckworth & Co., Manchester	26	1	8
Meadowcroft, W., & Sons, Glasgow ...	30	0	0
Rylands Company (Limited), Barnsley	95	8	5

Re George Bates Whelpton, 42 Yorkersgate, Malton, dispenser.—This debtor appeared for his public examination at Scarborough Bankruptcy Court on July 23 before Mr. Registrar Bedwell. The examination was adjourned until August 20.

Re John Hutchinson Wood, 72 Handcroft Road, Croydon, chemist and druggist.—At Croydon Bankruptcy Court on July 24, the public examination of this debtor took place. After the debtor had answered questions the examination was adjourned.

The Sanitas Company (Limited) have given notice of their intention to register in Cape Town the trade-mark "Creocide" in respect to disinfectants in Class II.

Deeds of Arrangement.

Holmes, Cain, 52 Burnett Avenue, Bradford, and **Spence, Albert,** 16 Town Lane, Idle, and trading at Town Lane, Idle, as C. Holmes & Co., aërated-water manufacturers. Trustee, John Butterfield, City Chambers, Darley Street, Bradford, chartered accountant. Dated July 26; filed July 27. Liabilities unsecured, 378*l.* 6*s.* 6*d.*; estimated net assets, 400*l.* 10*s.* 2*d.* The following are amongst the creditors:—

	£	*s.*	*d.*
Clayton & Jowett (Limited), Liverpool ...	13	0	0
Duckworth, —, Manchester	22	0	0
Garrett Frères, Southport	13	0	0
Rylands & Co., Barnsley	101	0	0

Purdie, Percy Wilfred, 27 Glenthorne Road, Hammersmith, chemist and druggist. Trustee, William H. Charlton, 11 Queen Victoria Street, E.C., accountant. Dated July 19; filed July 26. Liabilities unsecured, about 168*l.* 17*s.* 10*d.*; estimated net assets, about 91*l.* 10*s.* The following are scheduled as creditors:—

	£	*s.*	*d.*
Allen & Hanburys, London	12	0	0
Barclay & Sons (Limited), London ...	12	0	0
Barnett, H., London	13	0	0
Barron, Harveys & Co., London	21	0	0
Brixton Free Press and Advertisement Company, London	11	0	0
Davy, Hill & Son, Yates & Hicks, London	16	0	0

Gazette.

Partnerships Dissolved.

Merson, W., and **Morris, L. F.,** under the style of Merson & Morris, Bournemouth, dental surgeons.

H. J. Pick, T. F. Killick, and **G. E. Havinden,** under the style of Pick, Killick, and Havinden, or Pick, Killick & Co., the Commercial Sale Rooms, Mincing Lane, and Trinity Square, E.C., general merchants.

The Bankruptcy Acts 1883 and 1890.

Adjudication.

Munday, John, Cardiff, chemist.

Order made on Application for Discharge.

Foster, Ethelbert, Widnes, chemical manufacturer. Discharge suspended for three years, ending June 28, 1904.

New Companies & Company News.

Smith & Co. (St. Helens) (Limited).—Capital 5,000*l.*, in 1*l.* shares. Objects: To carry on the business of manufacturers of and dealers in mineral and aërated waters, British cordials, liqueurs, jams, jellies, essences, fruit-compounds, drugs, chemicals, and chemical-products, &c.

Border and South-east of Scotland Aërated-water Manufacturers' Protection Association (Limited).—Registered at Edinburgh with 100 members, each liable for 5*l.* Objects: To protect the bottles and boxes of members from being used or dealt with by unauthorised persons, &c. Registered office, 7 High Street, Jedburgh.

Hart & Co. (Limited).—Capital 2,000*l.*, in 1*l.* shares. Objects: To acquire the business carried on at Egerton Street and Castle Gate, Nottingham, by Hart & Co., and to carry on the business of manufacturers of, and dealers in, aërated and mineral waters and other drinks, &c. No initial public issue. Registered office, Egerton Street, Nottingham.

Runcorn White-lead Company (Limited).—Capital 90,000*l.*, in 1*l.* shares. Objects: To adopt (if approved) an agreement with J. E. W. Carlton and F. D. Hessey, and to carry on the business of importers and manufacturers of and dealers in white-lead, desilverizers, chemists, druggists, drysalters, oil and colourmen, dealers in proprietary articles, &c. No initial public issue.

Scottish Oxygenated Milk Company (Limited).—Registered at Edinburgh. Capital 10,000*l.*, in 1*l.* shares. Objects: To purchase the exclusive licence to work and vend the inventions for the preservation of milk and cream covered by British patents 7,371 of 1898 and 10,973 of 1900, and to carry on in Scotland the business of dairymen, milk-dealers, aërated milk and water manufacturers and salesmen, &c.

PIKE BROTHERS & HOLE (1901) (LIMITED).—Capital 2,500*l.* in 1*l.* shares (500 preference). Objects: To acquire the business carried on at Norwood by E. L. O'Brien (late Pike Brothers & Hole, Limited), and to carry on (*inter alia*) the business of chemists, druggists, opticians, and surgical-instrument makers. No initial public issue. Registered without articles of association. Registered office, 100 Norwood Road, Tulse Hill, S.E.

SUPER-AËRATION (FRANCE), (LIMITED).—Capital 125,000*l.*, in 1*l.* shares. Objects: To acquire from tho Ophir Guarantee Association (Limited) the benefit for France and her colonies of certain inventions relating to the drawing-off or dispensing of aërated liquids, to acquire any similar inventions, and to carry on the business of mineral-water manufacturers, manufacturers of bottles, syphons, soda-water machines, gazogenes, &c. Registered office, 82 Bishopsgate Street Within, E.C.

SOUTH STREET TRADING COMPANY (LIMITED).—Capital 2,000*l.*, in 1*l.* shares. Objects: To carry on the business of general textile manufacturers, haberdashers, milliners, boot and shoe makers, dealers in leather goods, provisions, drugs, household furniture, stationery and fancy goods, chemical-merchants, engineers, hardware-merchants, &c. No initial public issue. The first directors are G. H. Smith, J. Shaw, T. A. Hopper, R. C. Hopper, R. Clough, and T. C. Smith. Qualification, 50*l.* Remuneration as fixed by the company. Registered office, 16 South Street, Scarborough.

BERRENO SYNDICATE (LIMITED).—Capital 1,000*l.*, in 1*l.* shares. Objects: To acquire the business carried on by Mrs. K. J. Hartnett at Latchmere Road, Kingston-on-Thames, with the formula for making the remedy known as "Berreno," and to carry on the business of "Berreno" manufacturers, perfumers, chemical, drug, and proprietary article manufacturers, &c. The first subscribers are:—Mrs. K. J. Hartnett, Latchmere Road, Kingston-on-Thames; W. M. Beatson, Latchmere Road, Kingston-on-Thames; J. Brooks, 36 Mark Lane, E.C., merchant; Mrs. Beatson, Latchmere Road, Kingston-on-Thames; H. L. Beeching, 36 Mark Lane, E.C., merchant; B. Gillman, 15 Allé Victor Hugo, Le Reiney, France; and Mrs. A. Travis, 23 Doughty Street, W.C. Minimum cash subscription, 100*l.*

HAMOR LOCKWOOD & CO. (LIMITED).—Capital 40,000*l.*, in 1*l.* shares. Objects: To take over the business carried on by Hamor Lockwood at Manchester and elsewhere as "Hamor Lockwood" and "H. Lockwood & Co.," and to carry on the business of manufacturing chemists and druggists, cement, concrete, and asphalte manufacturers, manufacturers of products of coal-tar, contractors, engineers, metal, stone, and wood workers, builders, general paviors, &c. The first subscribers are:—H. Lockwood, Manley Park, Manchester, chemical-manufacturer; W. R. Bootland, 3 Mosley Street, Manchester, cotton-manufacturer; F. Foster, 17 Withy Grove, Manchester, accountant; T. H. Hall, Manley Park, Manchester, analytical chemist; J. Jessop, 387 Edge Lane, Droylsden, cashier; L. Crowe, 522 Edge Lane, Droylsden, manager; and L. A. Crowe, 522 Edge Lane, Droylsden, clerk. No initial public issue. The first directors are Hamor Lockwood, William R. Bootland, and Frederick Foster. Qualification, 250*l.* Remuneration, 200*l.* per annum, divisible. Registered office, 49 Blackfriars Street, Manchester.

BOVRIL (LIMITED).—The directors recommend interim dividends on the preference and ordinary shares at the rates of 5½ per cent. and 7 per cent. respectively.

SPRATT'S PATENT (LIMITED).—The directors have declared an interim dividend for the six months to June 30 last on the ordinary shares at the rate of 6*s.* per share.

BORAX CONSOLIDATED (LIMITED).—The directors have decided to pay an interim dividend on the ordinary shares of 5*s.* per share in respect of the quarter ended March 31 last.

SANITAS COMPANY (LIMITED).—The directors have declared an interim dividend at the rate of 5 per cent. per annum for the six months ended June 30, payable on September 2.

PRICE'S PATENT CANDLE COMPANY (LIMITED).—The directors announce that an extraordinary general meeting of the company will be held on September 6 for the purpose of declaring a dividend for the half-year ended June 30, and that without making any deduction for depreciation the accounts show a profit for the half-year of about 33,100*l.*, to which is to be added 6,637*l.* brought forward. The directors recommend a dividend of 15*s.* per share, which will absorb 28,125*l.*, and leave about 11,600*l.* to be carried forward.

SPRATT'S PATENT (AMERICA) (LIMITED).—The annual general meeting was held on July 25 at Winchester House, Mr. Robert Baelz presiding. In moving the adoption of the report, the Chairman stated that last year's profits exceeded those of the previous year by 2,400*l.* The sales had advanced satisfactorily, and in a larger proportion than in previous years; and the cost of materials, excepting coal and coke, had also been in favour of the company. Possibly, the business might be extended by advertising it more freely, but their financial position did not justify further outlay in this direction than the board had already gone to. He thought that the shareholders would approve the policy of paying away as dividend only about one-third (1,191*l.*) of the year's net profit, placing 1,500*l.* to reserve account, and leaving 1,183*l.* for directors' fees and to carry forward. The motion was adopted. After some discussion on the subject, it was resolved to allocate 250*l.* to the directors for their services.

J. LLWELLYN & CO. (LIMITED), SHANGHAI.—Mr. Alex. MacLeod presided at the twelfth ordinary general meeting of this company of chemists and druggists held at Shanghai in June. He said that the company had done on the whole a very profitable business during the past year. He regretted, however, to say that their branches at Tientsin and Peking had suffered severely from the Boxer trouble, their stock of drugs there having been completely destroyed or looted. The total loss came to about $7,500, and they had put in their claim for that amount against the Chinese Government, and the directors had every reason to believe that the claim would in due course be paid. Regarding the accounts there was only a small balance of $1,621 at credit of profit and loss account, which they had proposed to carry forward to new account. In reply to questions the Chairman said it was not their intention to re-establish their branches at Tientsin and Peking. The report and accounts were adopted. Mr. C. W. Wrightson was re-elected a director, and Mr. Drummond Hay, auditor.

Business Changes.

MR. RILEY has acquired the business at 20 Shepherd's Bush Road, W.

MR. W. B. SPENCER has succeeded to the business of Mr. Gurnell, Waterlooville, Hants.

THE chemist's business of Mr. W. H. W. Pugh, 2 Lombard Terrace, Woolwich Road, Charlton, S.E., has been closed.

MR. W. H. CLEMENT, chemist and druggist, has purchased the business of Mr. Tom Holland at 174 High Street, Lincoln.

MR. ARTHUR F. TAYLOR, chemist and druggist, has removed from 12 Lynthorne Road, Frizinghall, Bradford, to 203 Bradford Road, Frizinghall.

MR. J. F. WOODS, chemist and druggist, of Liverpool, has purchased the business at Formby (Lancs) formerly carried on by the late Mr. Sam Kershaw.

MR. R. NICHOLSON, pharmaceutical chemist, Bondgate Darlington, announces that his branch pharmacy at 12 Blackwellgate, Darlington, will be closed after August 6.

MR. J. GRIFFITH, 24 & 25 The Borough, Farnham, has sold his business to Mr. A. Dunston, chemist, of the same town, who will trade under the style of Griffith & Co.

MR. THOMAS MANN, chemist and druggist, Hampton Hill, has sold his pharmacy to Mr. H. E. Clement, who already has a business in the High Street. Mr. Mann, who carried on the above business successfully for thirty-two years and was previously at Stockbridge, Hants, is retiring at the ripe age of 82.

IMPORT DUTIES IN PERSIA.—It is notified that a new Persian law has fixed uniform import and export duties at Persia at 5 per cent. *ad valorem*, with a road-tax amounting to 6*d.* per 240 lbs.

Personalities.

IN the pass-list of the July examination of the Institute of Chemistry for the intermediate examination, occur the names of Mr. H. Finnemore and Mr. T. E. Wallis, B Sc. (Lond.), both from the Pharmaceutical Society's Laboratory.

DR. R. TANNER HEWLETT, of the Jenner Institute of Preventive Medicine, has been appointed to the professorship of general pathology and bacteriology at King's College, London, and Dr. St. Clair Thomson assistant physician for diseases of the throat.

MR. ASTON WEBB, A R A., the well-known architect, and Mr. Thomas Brock, R.A., the famous sculptor, are the men whose designs for the national memorial to Queen Victoria have been accepted. Mr. Webb is a brother of Mr. E. Alfred Webb, of the firm of Messrs. Evans, Lescher & Webb.

Marriage.

HALL—SMITH.—At St. Giles' Cathedral, Edinburgh, on July 26, by the very Rev. Dr. Cameron Lees, assisted by the Rev. Gavin Mason, of Sandbank, and the Rev. James Ferguson, of Corstorphine, George M'Millan Hall, son of the late Baillie Hall, Edinburgh, to Florence Shanklie, only daughter of the late Peter Shanklie Smith, sole partner of T. & H. Smith & Co. [The service was a fully choral one. The bride was given away by her brother, Mr. H. Ewing Smith, senior partner of Messrs. T. & H. Smith & Co. Among the presents received by the bride was a solid silver tea tray and service from the employés of the firm.]

Deaths.

BROOKES.—On July 13, Mr. Samuel Brookes, chemist and druggist, Lisson Grove. Aged 68.

BROWN.—At Coventry Road, Birmingham (the residence of her son, Dr. T. A. Brown), on July 21, Eliza Macdonald, widow of William Brown, pharmaceutical chemist, Dunfermline.

MAGGS.—On July 24, at St. Leonard's, Mr. Samuel Blount Maggs, pharmaceutical chemist. Aged 76. Mr. Maggs was a well-known resident of St. Leonard's, and had been in business at 36 Marina for over fifty years. He was found dead in one of the rustic arbours of St. Leonard's Gardens, the cause of death being heart failure, due to old age and the recent hot weather. Mr. Blount leaves five sons and three daughters. Two of the sons assisted him in the business.

OWEN.—On July 27, Mr. T. P. Owen, chemist and druggist, Pentre, Rhondda Valley. Aged 28. Mr. Owen died after a surgical operation.

PALMER.—On July 9, Mr. Henry Bridges Palmer, chemist and druggist, near Wingham, Sandwich. Aged 52.

REES.—On July 15, at 31 High Street, South Norwood, S.E., Nellie Roadnight Rees. Aged 11. Deceased was the daughter of Mr. Harding Rees, chemist and druggist, and died as the result of a fall from a swing.

AIAGIN is the name which the Aluminium Industrie Aktien-Gesellschaft, Neuhausen, give to a white salt for removing stains from fabrics without injury to the material. Messrs. C. Richter & Co., 90 Great Russell Street, W.C, are the British agents for aiagin. The manner of using the stain-remover is to cover the stain with the powder, moisten with water, and rub well into the material. The moistened powder is allowed to act for ten minutes, and then washed off with clean water. On moistening aiagin an effervescence takes place, and an alkaline solution results. The powder is sold in 6*d.* tins, and 1*s.* and 2*s.* 6*d.* bottles, and should be a useful novelty for the chemist's counter, especially at this time when fruit-stains prevail.

Correspondence.

German Commercial Ether.

SIR,—I have read your notice of the *Helfenberger Annalen* in your issue of July 20, in which you make comparisons unfavourable to Germany as to the commercial quality of English, American, and German ether. Will you allow me to say that your criticism is based upon a misapprehension of the tables published in the *Helfenberger Annalen*? At the end of these tables it is expressly mentioned with regard to ether that only the smaller number of the ethers of commerce answer the requirements of the German Pharmacopœia. This is not at all singular, because most of the ethers are ordinary commercial brands, and do not profess to be up to the Pharmacopœia standard. The fact that the ordinary commercial qualities, which need not be equal to Pharmacopœia requirements, were nevertheless mostly up to that standard can only be considered a recommendation of the German product.

Helfenberg, July 24. KARL DIETERICH.

Salaries in South Africa.

I notice in the South African News, in your issue of May 25 (page 824), that a correspondent remarks that 13*l.* a month here is only equal to 4*l.* a month at home, and warns chemists against coming out here after the war is over.

Whilst I certainly agree with him in advising assistants not to come here unless they have a berth to come to, either now or when the war is over, I must emphatically state that he is very much mistaken as to the value of money here, and it is quite evident he is a newcomer, or else has not studied the subject.

As a matter of fact, 13*l.* here is almost equal to, say, 7*l.* 10*s.* to 9*l* per month at home, and any assistant who thinks of coming out may safely rely upon this proportionate value of the respective salaries. As the remark on the part of your correspondent might tend to dissuade many young fellows from coming to South Africa, I feel it my duty to state the true state of affairs.

Cape Town, S.A. ALOES CAPENSIS. (222/44).

The P.A.T.A. Accounts.

SIR,—I am obliged to "Xrayser" for calling attention to the accounts of the P.A.T.A. and C.D.A., and for his appreciation of the work these Associations are doing. He is perfectly correct in saying that the P.A.T.A. accounts are not as healthy as they look, and his explanation of this is nearly accurate. The statement did not cover more than twelve months. Our fifteen-months' year was in 1897; but we still are suffering for that change. The bulk of the year's subscription runs from January to December, and is paid in the first quarter. If a balance-sheet had been drawn up we should have charged at least half the amount of the subscriptions as a liability. The financial year should coincide with the subscription-year. It is because we intend to make this change this year that we shall want increased funds and special donations. "Xrayser's" examination of the C.D.A. funds shows that we ought to have made it clear that the financial statement covered the first twelve months of the C.D.A.'s existence, whilst in our report we told of all our work up to the date of the annual meeting. The amount for legal charges which appears in the account does not cover half what was expended on our nineteen cases. The balance will appear in the current year's accounts.

W. S. GLYN-JONES,
August 1. Secretary to the P.A.T.A. and C.D.A.

What is an Apothecary?

SIR,—Will "Xrayser" kindly re-read my letter? I certainly said an apothecary was formerly a medical practitioner. I still adhere to my statement. Nearly 290 years ago the apothecaries were fully qualified medical practitioners; they are now fully qualified medical and surgical practitioners, *plus* their powers and privileges as apothecaries. Where has "Xrayser" obtained his right to sit in judgment upon one of our great medical qualifying corporations? I am, &c.,

PERCY G. LODGE, L.R.C.S. and L.S.A.
Bradford, July 27.

Trade Report.

NOTICE TO BUYERS.—The prices given in this section are those obtained by importers or manufacturers for bulk quantities or original packages. To these prices various charges have to be added, whereby values are in many instances greatly augmented before wholesale dealers stock the goods. Qualities of drugs and oils vary greatly, and higher prices are commanded by selected qualities even in bulk quantities. It would be unreasonable for retail buyers to expect to get small quantities at anything like the prices here quoted.

42 Cannon Street, London, E.C.: August 1.

The amount of public business transacted at the drug-auctions to-day was, we should think, the smallest on record, and, needless to say, the catalogues were disposed of expeditiously, the sales being concluded by noon. Consequently changes in value were few, and in many instances the quantity of goods offered was not sufficient to test values. Zanzibar aloes sold cheaply, and cardamom-seed was dearer. Cascarilla was plentifully offered, but met with no demand. Jamaica honey was slaughtered in order to effect business. Ipecacuanha was unchanged, but very dull. Ambergris was dearer. New senna sold exceptionally well, considering the quality. Jamaica wax was lower. Privately business in drugs and chemicals has been very quiet. The leading feature is a drop in bismuth, owing to shipments of metal from Bolivia. Several important Americant drugs have scored a substantial advance, notably senega, serpentary, and golden-seal, and still higher prices are looked for. Ergot is cheaper, and so are chamomiles. Jamaica was 1*s.* to 2*s.* dearer in sale, especially for the fine qualities. Quinine is still "sick," and the heavy bark shipments for July are not expected to improve the market. Both English and German refined camphor were reduced to-day. The following are the principal changes of the week:—

Higher	Firmer	Easier	Lower
Ambergris	Ammonia, sulphate	Buchu	Aloes (Zan.)
Cardamom-seed	Menthol	Chamomiles	Bismuth
Golden-seal		Ergot	Camphor (Eng. and Germ. refined)
Ginger (Jam.)		Pepper	Honey
Oil, lemongrass			Oil, clove
Senega			Oil, croton
Serpentary			Oil, cubeb
			Wax, bees' (Jam.)

Arrivals.

The following drugs, &c., have arrived at the principal ports of the United Kingdom, from July 24 to July 31, both inclusive:—Aniseed (Russian), 129; arrowroot (St. V.), 1,029; arsenic (@ Melbourne), 40; argols (@ Oporto), 22; asafetida (@ Bombay), 60 cs.; bleaching-powder (@ Antwerp), 53; bromine, 207 cs.; buchu, 18; calumba (@ Aden), 24; camphor (@ Kobe), 450 cs.; cardamoms, 20; caraway-seed (@ Rotterdam), 250; castor oil, (@ Marseilles) 56, (@ Leghorn) 33, (@ Cocanada) 64, (@ Calcutta) 520 cs., (@ Italy) 10; chillies (@ Natal), 28; citronella oil (@ Galle), 44; cod-liver oil, (@ Rotterdam) 60, (@ Christiansand) 45; coriander-seed (@ Calcutta), 10; cocoa-butter (@ Hamburg), 11; coriander (@ Morocco) 359; cream of tartar (@ Barcelona), 5; croton-seed (@ Colombo), 40; drugs (@ Marseilles), 81; ergot (@ Hamburg) 5; essential oils, (@ New York) 10, (@ Messina) 19, (@ Palermo) 2; fenugreek-seed, 150; galls (@ Smyrna), 10; gentian, 24 bales; gum arabic (@ Trieste), 10; honey, (@ Paris) 10, (@ Valparaiso) 20, (Chil.) 517; iodine (@ Valparaiso), 59; juniper-berries, 55; opium, (@ Smyrna) 54, (@ Trieste) 17; orris (Ital.), 22; potash chlorate (@ Gothenburg), 50; quicksilver (@ Seville), 3,500 flasks; quinine sulphate (@ Amsterdam), 34 cs.; saccharin, 4 cs.; sarsaparilla (@ Hamburg), 20; scammony-root (@ Marseilles), 93; shellac (@ Calcutta), 23; soy (Chin.), 233; wax, bees', (@ Leghorn) 11, (@Sydney) 21, (@ S.W.C. Africa) 42, (@ Barcelona) 27 (@ Aden) 59 pkgs. 7 bgs. 6 bdls.

The Sugar-duty.

A General Order, published on July 4, has been issued by the Custom House, directing that the following fixed rates of duty (per cwt.) be charged on the articles mentioned below:—

	s.	*d.*
Caramel, solid	4	2
Caramel, liquid	3	0
Soft confectionery, such as:— A. B. gums Chewing gums Jelly beans Turkish delight, &c.	3	0
Hard confectionery, such as:— Sugared almonds Caraway-seeds, &c.	4	2
Marzipan	2	6
Imitation crystallised fruits (Orange and lemon slices, &c.)	4	2
Tamarinds preserved in syrup	1	0
Ginger preserved in syrup or sugar	3	0
Cherries, drained, imported in bulk	2	3
Fruit-pulp, excepting that of figs and plums, preserved in thin syrup	1	0
Fruit-pulp, excepting that of figs and plums, preserved in thick syrup as jam	3	0
Flowers, as violets and rose-petals, &c., in crystallised sugar, as crystallised fruit	4	2
Chutney	2	0
Soy, when containing molasses or other sweetening matter	2	0
Blacking, solid, containing sugar or any other sweetening matter	1	0
Nestlé's milk-food	1	3
Cattle-foods containing molasses or other sweetening matter	1	0
Note.—An additional ½*d.* a lb. is chargeable in respect of any of the above-mentioned articles in which spirit has been used in the manufacture.		
Blacking, liquid, containing sugar or any other sweetening matter (Together with the duty on any proof spirit contained therein.)	1	0

Heavy Chemicals.

A continued quietness is still the main prevailing feature of the heavy-chemical market, and the demand in practically all departments and at all centres for both home and export account is considerably below the average for the time of the year. Under such circumstances values have a certain downward tendency, although for the most part they are at any rate nominally fairly well maintained. A reduction in output and general regulation of stocks prevent any great fluctuations.

Alkali-produce.—There is little of change to be reported in this branch. Bleaching-powder and caustic soda are perhaps in somewhat better demand than of late, but still are only very quiet. Prices are maintained without change. Soda crystals are in increased demand, and ammonia alkali also continues to move briskly. Prussiates and chlorates show no improvement from late weak tone. Saltcake keeps steady and in moderate request.

Sulphate of Ammonia is firmer again, and inquiry for former delivery much heavier. Present nearest figures are: Beckton, 10*l.* 15*s.*; Beckton terms, 10*l.* 12*s.* 6*d.*; London, 10*l.* 12*s.* 6*d.* to 10*l.* 15*s.*; Leith, 10*l.* 12*s.* 6*d.* to 10*l.* 13*s.* 9*d.*; and Hull, 10*l.* 10*s.* to 10*l.* 12*s.* 6*d.* Exports from Leith last week amounted to 865 tons.

South Durham Salts is being shipped much more freely, and works are considerably busier. Prices steady, at 11*s.* per ton, f.o.b. Tees.

Recovered Sulphur in steady request and somewhat scarce. Price firm, at 4*l.* 15*s.* to 5*l.* per ton, free on rails in bags.

Phosphorus in moderate demand, at unchanged rates. Wedges 2*s.* per lb., sticks 2*s.* to 2*s.* 1*d.* per lb., and amorphous 2*s.* 6*d.* to 2*s.* 7*d.* per lb.

Sulphate of Copper has taken a somewhat firmer tone, and inquiries for forward delivery are on the increase. Present quotations stand 21*l.* 15*s.* to 22*l.*, with Anchor 23*l.* and Liverpool 22*l.* 5*s.* to 22*l.* 10*s.*

Tin Crystals moving steadily at late rates of 8½*d.* to 8¾*d.* per lb.

Calcium Chloride in steady request and firm, at 60*s.* to 65*s.* per ton.

Pearl Hardening in fair demand on both home and export demand. Price shows little fluctuation and is steady at 3*l.* to 3*l.* 7*s.* 6*d.* per ton, free on rails or free on board.

Liverpool Drug Market.

Liverpool, August 1.

Castor Oil.—Owing to arrivals per s.s. *Senator*, the market for good seconds Calcutta has exhibited a somewhat easier tone, and $3\frac{3}{8}$*d.* has been accepted for a parcel from the quay. First-pressure French has maintained the comparatively low range of value lately ruling, and 3*d.* to $3\frac{1}{16}$*d.* is the value according to position. Second-pressure French is selling at $2\frac{7}{8}$*d.* to 3*d.* per lb.

Gum Acacia.—Further transactions are recorded in hard Senegal description at 56*s.* 6*d.* per cwt., and soft Soudan sorts at 50*s.* per cwt. Lower grades, such as Ghezirah are selling at 32*s.* 6*d.* to 37*s.* 6*d.* per cwt.

Grains of Paradise.—Seventeen bags just landed were offered at auction, 60*s.* was bid to clear the parcel, but owners held back for 70*s.* Part was afterwards sold at 65*s.* per cwt., and the balance of the lot was held at the same price.

Calabar-beans.—For a small quay lot at auction, 5*d.* was bid, but holder's idea of value was 6*d.* per lb.

Beeswax (Chilian).—One ton of mixed grey and yellow as imported, found buyers at 7*l.* per cwt., and the description ranges from 6*l.* 15*s.* to 7*l.* 12*s.* 6*d.*, according to quality.

Turps.—Easy, at 27*s.* 3*d.* to 27*s.* 6*d.*, with little business passing.

Canary-seed.—Stocks are much reduced, but value of good Turkish is still 32*s.* 6*d.* per quarter.

Honey.—Additional arrivals of Chilian have had a tendency to reduce values, but so far they are not quotably changed.

American Drug Market.

New York, July 23.

There is not much activity in the drug-market, but prices generally are maintained, and natural causes or speculative movements are responsible for most of the changes.

Balsam, Peru, is firmer at \$1.35 to \$1.40 per lb.

Camphor has declined to $59\frac{1}{2}$c., in bulk.

Cinchonidine is easier, in sympathy with the quinine market; 26c. per oz. will buy.

Beeswax is firm, owing to continued scarcity. Dealers ask 31c. to 33c. per lb. for ordinary pure.

Golden Seal.—Prime old root is in demand, and prices have jumped upwards; 48c. has been paid, and from 49c. to 55c. is asked, according to holder. Spring root is firmer at 43c.

Henbane-leaves are lower at 9c. to 10c., owing to arrivals of new crop.

Menthol is dull, and easy at \$3.50.

Morphine.—Active competition has resulted in a decline of 10c., and manufacturers quote \$1.85, in bulk.

Opium is easier, in sympathy with cable advices. Dealers quote \$$3.22\frac{1}{2}$ to \$3.25 per lb.

Quinine is quiet, in the absence of demand, but the tone of the market is easier, owing to the decline in bark. Manufacturers have as yet announced no change in quotations, but second-hands will sell, Java at 28c. and German at 31c. Supplies have also been offered at 1c. reduction from these figures.

Sarsaparilla.—Mexican has sold at $7\frac{1}{4}$c., and supplies are very scarce; $7\frac{1}{2}$c. is now inside.

Senega is moving upwards, chiefly owing to concentration of spot supplies and reports from the north-west regarding the new crop. Dealers ask 35c. to 36c., but these figures can be shaded.

Serpentary is scarce at 36c. per lb.

German Drug Market.

Hamburg, July 29.

Business in general is quiet, and our drug-market does not show much life.

Agar-agar is quiet and easier, at 355m. per 100 kilos.

Aloes, Cape, is tending firmer, and is held for higher prices to-day's quotation is 60m. per 100 kilos.

Anise is unchanged, at 35m. per 100 kilos.

Antimony.—Chinese is quoted $29\frac{1}{2}$m. and Japanese $30\frac{1}{2}$m. per 100 kilos.

Camphor (Refined) is dull, with second-hand sellers at 430m. to $427\frac{1}{2}$m. per 100 kilos.

Cumin-seed is dull, at 56m. and 58m. per 100 kilos. for Maltese.

Ergot is quiet; for shipment 340m. per 100 kilos. is quoted for Russian.

Golden-seal is very firm and advancing; 550m. per 100 kilos. is asked to-day.

Lycopodium is quiet, at 410m. per 100 kilos.

Menthol is scarce and firmer, at $25\frac{1}{2}$m. per kilo.

Ipecacuanha.—Rio is quiet, at 26m. per kilo., and Cartagena; at $12\frac{1}{2}$m. per kilo.

Quinine is dull, with second-hand sellers at 41m. per kilo.

Senega is firmer, and advancing; Western root is now quoted 345m. to 350m. per 100 kilos.

Star-anise is very dull and neglected; business has been done at $117\frac{1}{2}$m. per 100 kilos.

Turpentine quiet; American on the spot is quoted $53\frac{1}{2}$m. to 53m. per 100 kilos.

Japanese Wax is firmer, at $63\frac{1}{2}$m. per 100 kilos.

Oils, Fixed.—Cod-liver oil is unchanged, at 65m. per barrel; castor steady, but little doing, first-pressing in London, spot, is quoted 59m., and forward delivery 57m. per 100 kilos; linseed quiet.

Oils, Essential, show very little change. Star-anise is dull, at $11\frac{1}{2}$m. per kilo.; Japanese peppermint is firm, at $7\frac{1}{8}$m. per kilo., and American HGH at 6.40m. per lb.; caraway-seed (0·910) firm, at 9 to $9\frac{1}{8}$m. per kilo.; carvol (0·910) also firm, at $15\frac{1}{4}$m. per kilo; sandalwood is quoted $22\frac{1}{2}$m. per kilo.

Cablegram.

Hamburg, August 1, 2 p.m.:—The camphor-refiners have reduced their quotations to 440m. per 100 kilos., and second-hand holders now offer at 420m. A better feeling is reported in American HGH oil of peppermint at 6·45 per lb. Citric acid is dull of sale at 275m. per 100 kilos.

London Markets.

Arrowroot.—Steady. At auction on Wednesday ordinary St. Vincent's sold at $1\frac{1}{4}$*d.*, fine at $2\frac{1}{8}$*d.* to $2\frac{1}{4}$*d.* in barrels, at $2\frac{5}{8}$*d.* in half-barrels, and at 3*d.* per lb. in cases. Bermuda was bought in at 1*s.* 6*d.* per lb.

Asafetida.—The s.s. *Morocco* from Bombay has arrived at Hull with 60 cases.

Balsam Copaiba.—In Liverpool there is little inquiry, the only sales from first-hands being 2 barrels cloudy Maranham at 2*s.* $0\frac{1}{2}$*d.* per lb.

Balsam Tolu.—Holders of small tins quote 1*s.* 4*d.* per lb. and large tins 1*s.* 2*d.*

Bismuth.—On Friday of last week the price of metal was unexpectedly reduced from 6*s.* to 5*s.* per lb. Makers of salts have therefore made a corresponding reduction, and prices are now as follows:—

—	List-price and below 112 lbs.		112 lbs.	
	s.	*d.*	*s.*	*d.*
Carbonate	6	1	6	0
Subnitrate	5	5	5	4
Citrate	5	8	5	7
Nitrate	3	5	3	4
Oxide	7	10	7	9
Salicylate	6	0	5	11
Tannate	4	2	4	1

Two-cwt. and 5-cwt. quantities are subject to a further slight reduction on above prices. Unexpected shipments of the metal from Bolivia are responsible for the drop.

Caffeine.—As already announced in our Coloured Supplement last week quotations have been reduced by 1*s.* 10*d.* per lb., the immediate cause of the reduction being due to the fact that synthetic caffeine is shortly expected on the market. The revised prices are now as follows:—Caffeine crystals, 14*s.* 6*d.* per lb.; 10-lb. lots, 14*s.*; and 100-lb. lots, 13*s* 6*d.* Caffeine citrate (B.P.), 10*s.*; 10-lb. lots, 9*s.* 6*d.*; and 100-lb. lots, 9*s.*

Camphor.—Both English and German refined were reduced 1*d.* per lb. to-day. English is now quoted at 2*s.* 3*d.* per lb. in ton lots, and German at 2*s.* There are sellers of Japanese crude at 153*s.* to 154*s.* per cwt., c.i.f.

Cascara Sagrada.—The market is exceedingly firm in the United States; for October-November shipment per direct sailer 22*s.* per cwt., c.i.f., is quoted for new bark. On the spot, 25*s.* to 26*s.* is asked for new and 29*s.* to 30*s.* for two-year-old.

Chamomiles.—The common quantities of new Belgian flowers are coming forward more freely, and prices, in consequence, are a little easier, holders on the spot asking from 85*s.* to 87*s.* 6*d.* per cwt. Old-crop flowers are obtainable at 71*s.* 6*d.* to 72*s.* For really fine flowers of first picking, 92*s.* 6*d.* is asked.

Cinchona.—The exports from Java during July amounted to 1,228,000 Amst. lbs., against 629,000 Amst. lbs. last year. The total for the seven months now amounts to 6,376,000 Amst. lbs , against 4,729,000 Amst. lbs. last year. In the drug-auction, 8 serons Crown bark were withdrawn, and 37 bales Yellow bark were bought in.

Cocoa-butter.—To the auctions to be held on August 6, at Amsterdam, 5 tons of a foreign brand have been added. The total now consists of 45 tons Van Houten's, $1\frac{1}{2}$ tons Helm, and 2 tons De Jong besides the above foreign brand. At London on August 13, 35 tons of Cadbury's brand will be offered.

Dandelion-root.—A Continental advice reports that the quotations for hard winter root are exceedingly low, and give little encouragement to collectors, so that only limited quantities may be brought in this season, and prices may probably improve in the course of the winter. Cut root is quoted at 33*s.* 6*d.* per cwt., and old root from 25*s.* 6*d.* to 27*s.* per cwt., according to quantity, delivered London.

Ergot.—Prices are still tending lower, there being offers of new-crop Russian from Hamburg at 1*s.* $6\frac{1}{2}$*d.* per lb , c.i.f., for delivery in six weeks, and 1*s.* 7*d.* for Spanish. In face of this declining market, there was no demand for the parcel of 9 bags Spanish offered in auction to-day, and only one bag sold at 1*s.* 10*d.* per lb., the remainder being bought in at 2*s.*

Galls.—Persian are very quiet, only small sales of blue being reported. The principal importers are very firm, and do not offer at present prices.

Golden Seal has advanced to 2*s.* 5*d.* per lb. net, spot, and even at this figure single packages only are obtainable Very little is now to be had on the spot, and one importer has practically cleared his holdings.

Gum Arabic —An improved demand is reported in so-called Persian insoluble gum, business having been done in low sorts and small pale at steady prices. For pale selected, 23*s.* is asked; ordinary worked sorts, 17*s.* to 18*s.* 6*d.*; and unworked, 15*s.* to 17*s.* per cwt. In the drug-auction picked Trieste tear was held for 6*l* 5*s.* per cwt.

Hellebore-root.—Good sound root is quoted at 16*s.* 3*d.* per cwt for ton quantities, delivered London.

Lycopodium.—In spite of fairly large stocks in Russia prices are tending upwards there ; for double-sifted, in bags and cases, 1*s.* $10\frac{1}{2}$*d.* per lb. is quoted, delivered London.

Menthol is firmer and selling very freely at 12*s.* per lb. for Kobayashi crystals. To-day one of the principal dealers is asking 11*s.* 3*d.* To arrive, 10*s.* c.i.f. is quoted.

Oil, Cloves, has been reduced to 2*s.* 10*d.* per lb. for English, and to 2*s.* 7*d.* for second quality.

Oil, Cod-liver.—Our Bergen correspondent writes on July 27 that the market continues very dull. The export of cod-liver oil during the last week was very poor, the extremely hot weather being against the business. The quotation for best Lofoten non-congealing oil is unchanged, at 64*s.* per barrel, f.o b. Bergen. The exports to date amount to 6,159 barrels, against 4,839 barrels at the same time last year. The London market is quiet as usual at this time of the year, and good brands are obtainable at 65*s.* per barrel ex wharf.

Oil, Croton —A slight reduction has been made, English being listed at 3*s.* 3*d.* per lb.

Oil, Cubeb —The list-price for English has been reduced to 4*s.* per lb.

Opium.—In Persian opium small sales of fine have been made at 11*s.* 6*d.* per lb., and there are still sellers at this figure.

Smyrna, July 19.—The market here is quiet and unchanged, the sales amounting to 8 cases only, of old selected Karahissar, at the equivalent of 9*s.* 4*d.* to 9*s.* 6*d.* per lb., c.i.f. The arrivals of new opium to date amount to 608 cases against 1,250 cases during the corresponding period of last year. The prospects regarding the crop appear to be more satisfactory owing to the change in the weather.

Constantinople, July 27.—The only sales to report during the past week are three cases Karahissar type, at 8*s.* 5*d.* per lb., f.o.b. It is now practically certain that the crop will yield 5,500 cases. The weather continues very fine, and gathering in high districts is proceeding under the most favourable circumstances. The market keeps very quiet, and buyers continue to hold off for lower prices. Sellers are beginning to show signs of giving way.

Otto of Rose —A circular has been issued by Mr. H. A. Holstein, Kezanlik and Constantinople, estimating this year's crop of otto of roses at about 550,000 meticals, equal to 82,500 Turkish oz., against 120,000 T. oz. in 1900, 19,000 in 1899, 48,000 in 1898, 70,000 in 1897, 110,000 in 1896, and 72,000 in 1895.

Quillaia.—In Liverpool 12*l.* 15*s.* per ton has been accepted for 76 bales from the quay.

Quinine.—The market has remained in the same inanimate condition throughout the week, with retail sales only including December, at 1*s.* 2*d.* per oz. The spot-price is quite nominal, at from 1*s.* $1\frac{1}{2}$*d.* to 1*s.* $1\frac{3}{4}$*d.* The bark-shipments from Java, which are heavy, have had a depressing effect on the speculative market.

At the auction of quinine at Batavia on July 24 2,100 kilos. (73,500 oz.) Ed. II. sold at an average of $21\frac{1}{2}$fl. per kilo. (about equal to $8\frac{1}{2}$c. Amsterdam unit). At the previous auction on June 19 an average of $23\frac{1}{2}$fl. per kilo. was paid for this quality. The next auction to be held at Batavia will take place on September 5.

Safrol.—The quotation for ton lots is 1*s.* 4*d.* per lb., and business has been done at this figure.

Senega has advanced another 1*d.* on the spot, holders now asking 1*s.* 9*d.* per lb , net, to arrive ; the c.i.f. price has also advanced to 1*s.* 7*d.* to 1*s.* $7\frac{1}{2}$*d.*, according to importer.

Serpentary is considerably dearer, holders having now advanced their spot quotation to 2*s.* per lb.

Spices.—Jamaica ginger sold at dearer rates on Wednesday, but other articles were slow and unchanged in value. At auction Cochin *ginger* sold at 36*s.* per cwt. for fair washed rough, and one lot of good at 37*s.* 6*d.*, but the bulk was bought in ; cuttings partly sold at 33*s.* for good bright ; bold rough was bought in at 47*s.* ; small cut sold at 45*s.*, tips at 41*s.*, medium and small cut at 53*s.*, and bold, some medium, at 85*s.* 6*d.* ; bold cut was bought in at 90*s.*, good small at 50*s.*, and unassorted at 55*s.* to 60*s.* per cwt. Jamaica sold, with good competition, at about 2*s.* per cwt. advance, common to good common at 36*s.* to 40*s.*, middling dull to fair washed at 41*s* to 49*s.*, and good bold at 56*s.* to 61*s.* 6*d.* per cwt. Zanzibar *cloves* are steady ; ordinary dark were bought in at $3\frac{3}{4}$*d.* per lb. The delivery market is quiet at $3\frac{11}{16}$*d.* for October-December delivery. Common Penang partly sold at $5\frac{1}{4}$*d.* per lb. Fine Nyassaland *chillies* were bought in at 52*s.*, and Japan at 46*s.* per cwt. East India *capsicums* were not in request, and were withdrawn at 20*s.* to 23*s.* per cwt. *Pimento* firm, ordinary being bought in at $3\frac{1}{8}$*d.* per lb. Wild *cassia-buds* were withdrawn at 20*s.* per cwt. *Pepper* is rather easier for black ; Singapore was bought in at $6\frac{1}{8}$*d.*, Penang at $5\frac{3}{4}$*d.*, Tellicherry and Aleppy at $6\frac{1}{4}$*d* , while East India sold at $5\frac{7}{8}$*d.*, and fine Ceylon at 6*d.* per lb. Singapore for arrival has been sold at $6\frac{3}{32}$*d.* for September-November steamer. White steady, Singapore being bought in at $9\frac{1}{4}$*d.* and Penang at $8\frac{3}{4}$*d.* per lb. The next auctions will be held on August 14.

Tragacanth.—Prices remain irregular, and for the lower grades, which are pressed for sale, easier rates would be accepted. Stocks of seconds and thirds are getting smaller however, and, with an improved demand, prices show a slight recovery.

Wax, Carnauba.—A neglected market in Liverpool, with retail sales at from 75*s.* to 82*s.* 6*d* for ordinary to good yellow, with Maranham grey at 57*s.* 6*d.* per cwt.

London Drug-auctions.

The following table shows the goods offered and sold publicly, the figures referring to the original packages :—

	Offered	Sold
Albumen	7	0
Aloes (Zan.)	4	4
Ambergris	2	2
Ammoniacum	19	0
Antimony	50	0
Araroba	12	0
Areca	27	0
Argol	5	0
Balsam copaiba	2	5
Benzoin—		
Siam	2	0
Sumatra	122	10
Bird-lime	20	0
Buchu	55	6

	Offered	Sold
Calumba	190	48
Canella alba	11	0
Cardamoms	47	7
Cascarilla	37	0
Cevadilla	4	4
Cinchona	45	0
Cumin-seed	27	0
Cuttlefish-bone	15	0
Elaterium	1	0
Ergot	9	1
Gum acacia	10	0
Hellebore	10	0
Honey (Jamaica)	190	151
Ipecacuanha—		
(Cartagena)	21	0
Rio	38	0
Kola	1	0
Musk	1	0
Myrrh	12	0
Oil—		
castor (E.I.)	80	0
cinnamon-leaf	5	0
citronella	1	1
eucalyptus	49	0
lemongrass	2	2
Oil, lime	3	0
patchouli	5	0
peppermint(Jap.)	10	0
(Amer.)	15	0
rose (E.I.)	10	3
sandalwood	1	0
Saffron (tins)	10	0
Sandalwood	19	0
Sarsaparilla	16	6
Senna—		
Tinnevelly	92	77
Sugar of milk	10	0
Tamarinds—		
(W.I.)	66	15
(E.I.)	40	0
Wax (bees')—		
Australian	21	2
Chilian	9	0
Chinese	6	0
East Indian	53	0
Jamaica	34	34
Madagascar	32	32
Nyassaland	9	6
Spanish	22	0
Zanzibar	193	6

ALOES sold at considerably lower rates, 30*s.* per cwt. being paid for 2 cases of partly pasty and partly liquid Zanzibar hepatic in skins; and 2 cases of hard ditto at 40*s.* No other description offered.

AMBERGRIS.—The 2 tins offered sold with good competition at about 2*s.* 6*d.* per oz. dearer prices, 5*l.* 2*s.* 6*d.* being paid for exceptionally fine pieces.

AMMONIACUM.—Ordinary darkish and blocky gum with small loose tears was bought in at 32*s.*, and pickings at 16*s.* per cwt.

ARECA.—Partly wormy quality was bought in at 17*s.*

ARGOL.—Cape sold with good competition at from 40*s.* to 48*s.* per cwt. for grey and pinky.

BENZOIN.—There was little demand for Sumatra gum, and only 10 cases of common false-packed seconds found buyers at 5*l.* 15*s.* per cwt. Good fair seconds were bought in at 8*l.* 10*s.* per cwt. Siam was shown to the extent of 2 cases sifted pea and bean size, which were taken out at 11*l.*, no bid being made. Privately there has been a small business in Sumatra gum at from 7*l.* 5*s.* to 7*l.* 10*s.* per cwt.

BIRDLIME.—For Japanese in cases 9*d.* per lb. was the limit.

BUCHU.—In auction, although little business was done, prices were practically unchanged compared with private rates; 1*s.* per lb. would have purchased good green round leaf, but buyers would not spring more than 10*d.* Several bales of very stalky and yellowish leaf sold at 10*d.* to 11*d.* per lb., and a bale of yellow oblong leaf sold at 4½*d.*

CALUMBA.—Low grades were represented by 48 bags, 25 of which, consisting of medium to bold brown wormy sorts, sold at 10*s.* per cwt. The remaining 23 bags, mostly dark lean and stemmy sorts, false packed and damaged, sold at 3*s.* 6*d.* to 6*s.* Two other parcels of 118 and 24 bags had not arrived in time for sale.

CANELLA ALBA.—For nice pale medium to bold quill 45*s* was refused, and the parcel was taken out without mention of limit.

CARDAMOMS.—The meagre supply offered and the poor result obtained, were insufficient to test the market. The following were the sales:—Ceylon Mysores, bold pale long, 2*s.* 4*d.* (1 case); bold medium pale, 1*s.* 8*d.* (1 case); small and medium pale, 1*s.* 5*d.* Cardamom-seeds were 1*d.* dearer, 2*s.* 1*d.* being paid for the only case sold.

CASCARILLA.—Although there was a good selection on offer, no business was done; medium to bold silvery quill was bought in at 60*s.* to 70*s.* per cwt.

CEVADILLA.—Four bags from Tumaco realised 3*d.* per lb.

HONEY.—Jamaica was pressed for sale and met a decline of from 3*s.* to 5*s.* per cwt., compared with the previous sale-prices. Fair bright orange liquid in casks and cases sold at from 16*s.* to 17*s.*, and darker ditto at from 12*s.* to 15*s.*, according to colour.

IPECACUANHA.—The arrival of 197 bales of Rio root per the *Nile* from Monte Video was sufficient to prevent any public business in auction to-day, and every package offered was bought in at from 11*s.* 9*d.* to 12*s.* per lb., importers showing no disposition to ease their limits. Cartagena root was also slow of sale, the 21 packages offered being bought in at from 6*s.* to 6*s.* 6*d.*, the best obtainable being 5*s.* 4*d.* per lb.

MUSK.—For 1 tin of Yunan musk of fair quality a bid of 25*s.* per oz. is to be submitted.

MYRRH.—The only lot offered was 12 bales of dark pickings, which were bought in at the nominal price of 60*s.* per cwt.

OIL, CASTOR.—Good seconds Calcutta were held for 3¾*d.* per lb.

OIL, CITRONELLA.—One carboy of Java distilled oil sold at 1*s.* 4*d.* per lb.

OIL, LEMONGRASS.—Dearer. For Hardouin's brand from Penang 5*d.* per oz. was paid.

OIL OF PEPPERMINT.—In auction 10 cases of Hale & Parshall's brand were held for 5*s.* 6*d.* per lb. Privately Japanese 40-per-cent. is quoted 6*s.* 6*d.*, and dementholised 3*s.* 5*d.* per lb. on the spot, but for forward delivery the latter is quoted 3*s.* 8*d.* to 3*s.* 9*d.* per lb, c.i.f. American HGH is unchanged; Wayne County is quoted 4*s.* 8*d.* to 4*s.* 9*d.* per lb., and reported likely to be dearer.

OIL, ROSE (E.I.).—Settlings were sold as usual at from 1¾*d.* to 2½*d.* per oz.

SARSAPARILLA.—No grey Jamaica root was catalogued. Of the 10 bales Lima Jamaica offered 3 only had arrived, and they were sold at 1*s.* 1*d.* per lb. for slightly damaged, and 7*d.* for very chumpy and mixed ditto. Six bales of native Jamaica were offered, and only 3 sold at 9½*d.* per lb. for red and 5*d.* for common grey.

SENNA.—The first arrivals of new Tinnevelly crop were offered to-day, and, as usual at the beginning of the season, quality was very poor. It sold well, however, at slightly dearer prices, as follows:—Medium to bold greenish leaf, but partly specky, 2½*d.* to 3½*d.* per lb.; fair small and medium leaf, 1¾*d.* to 2*d.*; and common to ordinary specky, 1*d* to 1¾*d.* per lb Pods were unchanged, selling up to 2¾*d.* per lb. No Alexandrian senna offered.

TAMARINDS.—For a parcel of 40 barrels of good syrupy Antigua a bid of 9*s.* 6*d* is to be submitted, and for another parcel of 15 barrels, also from Antigua, catalogued as "duty free," 11*s.* to 11*s.* 6*d.* was paid.

WAX, BEES'.—Jamaica was from 5*s.* to 7*s.* 6*d.* per cwt lower in auction. Fine pale yellow to good red and brown sold at from 7*l.* 5*s.* to 7*l.* 12*s.* 6*d.* per cwt. Madagascar sold readily at unchanged rates, 6*l.* 12*s.* 6*d.* to 6*l.* 15*s.* being paid for good pale brown to dark. Zanzibar was freely offered, but only 6 bags of fair pale yellow and brown rolls sold at 6*l.* 15*s.* Good sound was held for 6*l.* 10*s.* Of Nyassaland wax 9 packages offered, of which 6 sold at 6*l.* per cwt.; and 2 cases Australian sold at 7*l.* 5*s.*

The New German Tariff.

THE commercial world of Germany has been somewhat startled this week by the premature and unauthorised publication of certain important details concerning the new Tariff Bill, which has forced the Government to change its plans by at once publishing a document purporting to be the draft of the new Bill. This draft has appeared in the official *Reichsanzeiger*, but the published rates are only provisional and may be modified by the Reichstag or the Federal Council. The leading features are the higher duties which it places on cereals, cattle, and agricultural produce, except potatoes, which are exempt from duty. These higher duties, if persisted in, are expected to lead to a serious tariff-war on the Continent, but with that we are not directly concerned. We hope to give details of the new tariff (as published in the *Reichsanzeiger*) next week.

IN consequence of the death of Mr. Julius Rau, the firm of J. Rau & Co., exporters of essential oils, &c., Leghorn, has been dissolved. Mr. Leonard Wahl, who was a member of the late firm, has taken Mr. Alfred Roedenbeck into partnership, and the business will now be conducted under the name of Roedenbeck & Wahl.